

JPRS-TEN-91-016
22 AUGUST 1991



JPRS Report

DISTRIBUTION STATEMENT A

Approved for public release;
Distribution Unlimited

Environmental Issues

DTIC QUALITY INSPECTED

19980515 105

REPRODUCED BY
U.S. DEPARTMENT OF COMMERCE
NATIONAL TECHNICAL
INFORMATION SERVICE
SPRINGFIELD, VA 22161

Environmental Issues

JPRS-TEN-91-016

CONTENTS

22 August 1991

INTERNATIONAL

Soviet Correspondent Urges Sharing of 'Secret' Canadian Global Ecology Study [Moscow PRAVDA 1 Jul]	1
Multilateral Talks on Bering Sea Fishing Begin in Tokyo [Moscow TASS 31 Jul]	2
Australia-France Talks Stress Continuing Cooperation on Antarctic [Melbourne Radio 22 Jul]	2
Bank of Tokyo Donates Fund for Environmental Programs in Developing Nations [Tokyo KYODO 31 Jul]	2
ASEAN Conference To Discuss Human Rights, Environment [Kuala Lumpur BERNAMA 18 Jul]	2
EC Denies Setting Human Rights, Environmental Conditions on ASEAN Development Assistance [Bangkok BANGKOK POST 24 Jul]	3
PRC's Liu Criticizes South Pacific Forum's 'Two China' Policy [AFP 1 Aug]	4
International Conference on Black Sea Held in Republic of Georgia Conference Begins Work [Tbilisi SAKARTVELOS RESPUBLIKA 13 Jul]	5
President Gamsakhurdia Urges International Cooperation [Tbilisi SAKARTVELOS RESPUBLIKA 13 Jul]	5
Shevardnadze Proposes International Organization [Moscow INTERFAX 23 Jul]	5
Participants Comment on Conference [Tbilisi SAKARTVELOS RESPUBLIKA 20 Jul]	6

AFRICA

REGIONAL AFFAIRS

SADCC Countries To Cooperate on Wetlands Conservation [Luanda JORNAL DE ANGOLA 13 Jun]	8
---	---

KENYA

Thika River Industrial Pollution Noted; Controls Urged [SUNDAY TIMES 9 Jun]	8
---	---

NIGERIA

Government Plans To Register Dual-Purpose, High-Risk Chemicals [Lagos Radio 31 Jul]	9
---	---

SOUTH AFRICA

Cape Town Pollution Levels Exceeding Accepted Levels [Johannesburg TV 17 Jul]	9
---	---

CANADA

Quebec Poll Finds Environmental Safety Favored Over Economic Development [LA PRESSE 1 Jun]	10
---	----

CHINA

State Director Analyzes Environmental Protection Investments, Policies [HUANJING BAOHU Nos 4 and 5, 25 Apr, 25 May]	12
--	----

EAST ASIA

REGIONAL AFFAIRS

Malaysia, Papua New Guinea Agree on United Stand at 1992 Brazil Conference [Kuala Lumpur BERNAMA 21 Jul]	21
Micronesia Applies for UN Membership; Issues Plea on Global Warming [AFP 28 Jul]	21
Environmental Issues To Dominate South Pacific Forum Meeting [Melbourne Radio 29 Jul]	21

AUSTRALIA

West Coast Oil Spill Investigated [AFP 23 Jul]	22
Government's Failure To Take Position on Tropical Timber Trade Scored [Melbourne Radio 1 Aug]	22

JAPAN

Former Finance Minister Calls for Expanded Conservation Program [KYODO 28 Jul]	23
National Transport Policy for Environmental Protection Viewed [KYODO 31 Jul]	23

SOUTH KOREA

Heads of Polluting Companies Arrested [THE KOREA TIMES 2 Aug]	23
---	----

PHILIPPINES

Government To Set Up Reforestation Fund [BUSINESS WORLD 24 Jul]	24
---	----

THAILAND

Growing Pollution Problem in Gulf of Thailand Cited [THAI RAT 12 Apr]	24
Industrial Pollution of Lake Songkhla Detailed [BAN MUANG 28 Apr]	24
Efforts To Promote Unleaded Gas Continue [SIAM RAT 30 Apr]	25

EAST EUROPE

REGIONAL AFFAIRS

Czechoslovak-Hungarian Talks Leave Danube Gabcikovo Dam Project Unresolved [Prague CTK 15 Jul]	27
Ministers Explain Slovak Government Decision on Gabcikovo Project [Bratislava PRAVDA 24 Jul]	27
Czechoslovak Minister Calls for Compromise With Hungary Over Gabcikovo [Prague LIDOVE NOVINY 30 Jul]	27
Protesters Demand Suspension of Gabcikovo Dam Construction [Prague CTK 30 Jul]	28
Bulgaria, Romania Consider Joint Action on Danube Environment Problems [Sofija BTA 30 Jul]	29
Romania, Bulgaria Sign Danube Environment Protection Protocol [Bucharest ROMPRES 31 Jul]	29

BULGARIA

Government Suspends Lead Production [BTA 25 Jul]	29
Environmental Commission Chairman Interviewed on Kozloduy Nuclear Plant [TRUD 18 Jul]	30
Radioactive 'Hot Spot' Reported at Kozloduy Nuclear Plant [Sofia Radio 24 Jul]	30
Kozloduy Nuclear Plant No. 6 Generating Unit To Be Started Up [BTA 25 Jul]	30
Two New Leaks Found at Kozloduy Nuclear Plant [AFP 26 Jul]	30
Recent Radiation Levels Reported 'Normal, Unchanged' [BTA 26 Jul]	31
USSR Atomic Power Ministry News Conference on Kozloduy Nuclear Plant Problems [Moscow KRASNAYA ZVEZDA 27 Jul]	31

CZECHOSLOVAKIA

High Cancer Rate in South Bohemia District Attributed to Radioactive Contamination [MLADA FRONTA DNES 17 Jul]	32
Soviet Military Dumps Pose Pollution Threat to Prague Water Supply [Prague TV 22 Jul]	32
New Restrictions on Imported Waste Materials Implemented [CTK 31 Jul]	32

HUNGARY

Environmental Damage by Soviet Troops Assessed as 'Greater Than Previously Imagined' [Budapest Radio 23 Jul]	33
Breakdown in Paks Nuclear Power Plant Reported [Budapest Radio 18 Jul]	33
Paks Nuclear Reactor Resumes Operations [MTI 24 Jul]	33

LATIN AMERICA

REGIONAL AFFAIRS

Belize, Mexico Issue Communique on Economic, Environmental Cooperation [Bridgeport CANA 22 Jul]	34
--	----

BRAZIL

Government Seeks To Demarcate Indian Lands [FOLHA DE SAO PAULO 29 Jun]	34
Rio-92 Secretary Garcia on Government's Environmental Policies, Debt Conversion [O GLOBO 30 Jun]	35
Ship Oil Spill Damages Beach in Guarapari [FOLHA DE SAO PAULO 20 Jul]	36
Pilot Program Seeks To Preserve Amazon, Atlantic Forests [O GLOBO 22 Jul]	36
General Vows To Fight Internationalization of Amazon [FOLHA DE SAO PAULO 23 Jul]	36
Government Sets Deadline for Formulating Environmental Policy [O GLOBO 23 Jul]	37
Collor Signs Decree on Protecting Ozone Layer [Brasilia Radio 24 Jul]	37

CHILE

Santiago Implements Emergency Antipollution Plan [EL MERCURIO 14 Jun]	37
---	----

COLOMBIA

Bogota Pollution Control Plan Proposed [EL TIEMPO 11 Jun]	39
---	----

HONDURAS

Deforestation Threatens Islas de la Bahias; Government Inaction Cited [LA PRENSA 27 May]	40
Official Sets Cost of Reforestation at \$566 Million [EL HERALDO 28 May]	40
Destruction of Deciduous Forests Continues [EL HERALDO 30 May]	41

NEAR EAST/SOUTH ASIA

REGIONAL AFFAIRS

New Focus on Water Resources Urged for Arab Countries [Cairo AL-WAFD 16 May]	42
Uzbekistan's Torrential Rains Attributed to Kuwait Oil Fires [Moscow PRAVDA 19 Jun]	43
Kuwaiti Oil Well Smoke Damages Forests, Pastures in Iran's Fars Province [Tehran IRNA 25 Jul]	43

EGYPT

Al-Munir Area Residents Protest Nuclear Waste Dumping Violations [AL-JUMHURIYAH 7 Jun]	43
Lake al-Manzalah Threatened by Pollution, Development [AL-AHALI 12 Jun]	45
Germany To Fund Cement-Dust Pollution Study in Hulwan Area [London AL-SHARQ AL-AWSAT 14 Jun]	46

INDIA

Controversy Over Safety of Tehri Dam in Himalayas Continues [AFP 19 Jul] 47

IRAN

Rising Caspian Sea Threatens Iranian Coast [KAYHAN INTERNATIONAL 15 Jun] 48

MOROCCO

Water Projects Program To Begin in Nador Province [AL BAYANE 27 Jun] 48
Construction Begins on Second-Largest Dam in Africa [L'OPINION 30 Jun] 49

SRI LANKA

Coastal Belt Coral Reefs Threatened [Colombo Radio 28 Jul] 50

TUNISIA

Progress in Sanitation, Water Purification Projects Detailed
[LA PRESSE DE TUNISIE 6 May] 50
Conference Held on Protecting Gulf of Gabes Marine Resources
[LA PRESSE DE TUNISIE 15 May] 52

SOVIET UNION

German Economics Institute Report on USSR Environmental Problems
[Berlin WOCHEBERICHT-DIW 16 May] 54
Lemeshev Reviews Morgun's Book on State of Environment [SELSKAYA ZHIZN 12 Jun] 66
New RSFSR Code on Mineral Wealth To Provide Stricter Controls on Resource Use
[ROSSIYSKAYA GAZETA 11 Jul] 68
Scientists Draft Siberian Oil Exploration Program [TASS 21 Jul] 68
Program of Health, Compensation Measures for Residents of Chernobyl-Affected Areas
[ROSSIYSKAYA GAZETA 18 Jun] 69
Kiev Residents Respond to IAEA Chernobyl Report; Invite Organization To Move to Pripyat
[Kiev Radio 18 Jul] 71
Belorussia Appeals to European Parliament for Chernobyl Aid [ZVYAZDA] 18 Jul 71
Scientists Evaluate Chernobyl Effect on Belorussia's Forests [Minsk Radio 22 Jul] 72
Latvian Government Offers Aid Plan For Republic's Chernobyl Victims [BALTFAX 20 Jul] 72
USSR Nuclear Society Conference on Radioactive Waste Disposal 72
Factors Influencing Lack of Concrete Progress [IZVESTIYA 29 Jun] 72
Nuclear Experts, Greens Share Dialogue [PRAVDA 18 Jul] 73
Atomic Reactor Construction in Dushanbe Stopped [Moscow Radio 17 Jul] 74
Construction of Two Underground Nuclear Power Stations Planned [Moscow Radio 21 Jul] 74
IAEA Findings on Safety of Crimea Nuclear Plant Protested [Kiev Radio 21 Jul] 74
Human Errors Cited in Reduced Nuclear Plant Capacity [TASS 23 Jul] 74
Kazakhs React To Proposed 'Very Last' Nuclear Tests at Semipalatinsk [TRUD 23 Jul] 74
Experts Warn of Possible Nuclear Accident in Komsomolets Submarine Salvage
[MOSCOW NEWS No 23, 9-16 Jun] 75
Past Nuclear Testing in Yakutia Investigated [ROSSIYSKAYA GAZETA 30 Jul] 76
Excessive Radioactivity Levels Cause Concern in City of Kazan [INTERFAX 31 Jul] 76
Swiss-USSR Joint Venture Utilizes Baku Oil Refinery Waste [TASS 16 Jul] 76
Problems, Achievements in Waste Recycling Noted [Moscow TV 20 Jul] 76
Ufa Chemical Works Officials on Trial for Polluting Drinking Water
[ROSSIYSKAYA GAZETA 3 Jul] 77
Protesters Demand Antipollution Steps at Zaporozhye Coking Plant [Moscow TV 21 Jul] 77
Scientists, Activists Protest Continued Leningrad Barrier Work [IZVESTIYA 3 Jun] 77
Cyclic Concept of Baltic Sea Ecology Advocated [VECHERNIYE NOVOSTI 15 Apr] 79
New Gas Drilling Rig Aims To Minimize Ecological Damage [Moscow TV 25 Jul] 79

Abandoned Cargo, Military Ships Pollute Kola Gulf	<i>[Moscow TV 16 Jul]</i>	80
Chemical, Waste Pollution of Dnepr River Detailed	<i>[MOLOD UKRAYINY 16 May]</i>	81
Excessive Pollutant Levels Noted in Odessa Coastal Waters		
<i>[KOMSOMOLSKAYA PRAVDA 29 Jun]</i>		82
Pollution Related Beach Closings in USSR Resort Areas	<i>[ARGUMENTY I FAKTY No 26, Jul]</i>	83
Second Edition of 'Red Paper' on Belorussian Ecology Issued	<i>[TASS 27 Jul]</i>	83
Official Looks to Economic Levers for Lithuania's Environmental Program		
<i>[LIETUVOS AIDAS 3 May]</i>		84
Above-Normal Radiation Levels in Latvian City Attributed to Military Radar Installation		
<i>[BALTFAX 18 Jul]</i>		86
Environmental Pollution in Estonia Surveyed	<i>[RAHVA HAAL 14 Dec]</i>	86
Goals, Work of Estonia's Greens Movement Outlined	<i>[VECHERNIY TALLINN 16 May]</i>	87
Ecological Damage Caused by Nagorno-Karabakh Conflict Assessed	<i>[PRAVDA 24 Jun]</i>	89

WEST EUROPE

REGIONAL AFFAIRS

Nordic Countries To Cooperate on Hazardous Waste	<i>[Stockhom DAGENS NYHETER 20 Jun]</i>	90
--	---	----

DENMARK

Environment Minister Discusses Policy Goals	<i>[BERLINGSKE TIDENDE 16 Jun]</i>	90
Sale of State Forestlands Opposed	<i>[BERLINGKSE TIDENDE 21 Jun]</i>	92
Farmers, Environmental Groups Debate EC Directive on Spraying Agents		
<i>[BERLINGSKE TIDENDE 21 Jun]</i>		92
Energy Board Reports Decrease in Sulfur, Carbon Dioxide Emissions		
<i>[BERLINGSKE TIDENDE 22 Jun]</i>		93

FINLAND

Nature Conservation League's Energy Program Oulined	<i>[HELSINGIN SANOMAT 6 Jun]</i>	94
---	----------------------------------	----

FRANCE

Renault, Peugeot Setting Up Systems for Recycling of Automobile Parts		
<i>[LIBERATION 22-23 Jun]</i>		94
ELF-Aquitaine Oil Company Investing in Production of Unleaded Gasoline		
<i>[L'USINE NOUVELLE 4 Jul]</i>		95
CFC Replacement Proving Difficult for Refrigeration Industries		
<i>[LE NOUVEL ECONOMISTE 5 Jul]</i>		95
Plans for Achères Water Treatment Facility Cancelled	<i>[LE MONDE 14-15 Jul]</i>	96

GERMANY

Government Interim Report on Radioactive Waste Disposal Research		
<i>[TECHNOLOGIE NACHRICHTEN-PROGRAMM INFORMATIONEN 18 Mar]</i>		97

Soviet Correspondent Urges Sharing of 'Secret' Canadian Global Ecology Study

91WN0597A Moscow PRAVDA in Russian 1 Jul 91
Second Edition p 5

[Article by PRAVDA Correspondent V. Shelkov, Ottawa, under the rubric: "Ecology and the National Security of States: Intelligence Has Reported...."]

[Text] Farsighted people have already long ago aroused society and the state leaders of various countries that protection of the national security of many states in all probability will undergo substantial changes with the Cold War receding into the past and the reduction of armed confrontation between East and West. If primary efforts were previously reduced to preventing the enemy from gaining military or political advantages, obviously in the future we will have to gradually change the emphasis to the dangers that threaten all mankind.

Among those "universal villains," a number of ecological problems is the most serious. It is no accident that already right now the departments that are responsible for the security of their states are all the more intently looking at these problems while attempting to detect the possible consequences of the worsening of the ecological situation on the planet.

A number of Canadian governmental institutions recently undertook an attempt to analyze the state of the environment in the developing countries and to predict the effect of the changing natural conditions in the Third World on the situation in Canada. As a result of their joint efforts, a report was published and stamped "Secret" with the notation "For Canadian Officials Only." This document, which the Canadian Press information agency managed to obtain and, as we reported, was prepared by the Canadian Intelligence Committee with the participation of the Ministries of the Environment, Defense, and Foreign Affairs.

The value of the document that has become worthy of publicity, notes the local press, consists of the fact that, having discarded diplomatic language, its authors call a spade a spade. The report asserts that the degradation of the environment in Third World countries is so serious that with a great degree of certainty one can talk not only about ecological catastrophe but even about a conflict between North and South which could replace the reduced East-West political and military confrontation.

What are the primary spheres that have caused the particular concern of the report's compilers? First of all, it is aid to the African countries. Without substantial expansion of this aid, it is difficult to count on any sort of stable economic development of the Black Continent and consequently on improving the environment. Extreme poverty and degradation of the soils will be

maintained for the foreseeable future in Africa. The advance of the desert will continue. Unfortunately, African governments will not change their favorable attitude toward locating Western enterprises' toxic wastes in their own countries for payment.

The report notes that overpopulation and the fight for water sources are capable of resulting in a conflict in the Middle East. Israel, which controls Jordan's West Bank, can largely determine the water supply in the region.

Even the normally farsighted Japanese are unfortunately making their contribution to the destruction of nature. The Canadian report testifies in this regard that, while protecting its own timber reserves, Tokyo is little by little destroying the forests of other Southeast Asian countries.

It is understandable that the report does not bypass in silence the ecological situation in our country. They note the government's attempts to reduce budget expenditures which, according to Canadian expert assessments, will not promote the struggle with serious environmental pollution problems. The document states that the population's concern with the state of the environment and society's massive demonstrations that are associated with it can result in the closure of key industries, specifically, in the energy industry complex. Naturally, this development of events will result in further economic difficulties.

In their work, the Canadian experts examine the prospects for combating acid rain. While talking about legislation that has been adopted in the United States to reduce industrial discharges into the atmosphere that lead to this phenomenon, they call for a reassessment of the significance of Washington's measures. We must not forget, the authors stress, that the lakes and forests that have already been destroyed by acid rain will require 20-30 years in order to recover from the damage inflicted on them. All the more so since another problem remains and is worsening—automobile exhaust gases continue to promote acid rains.

Almost all of the facts cited in the document, warn the authors' collective, will have perceptible consequences for Canada, will affect her vital interests, and will be reflected in the population's well-being.

The question arises: Did the report's authors act properly by designating it only for the use of Canadian officials? The time has already long since arrived not to whisper but to talk aloud about the ecological catastrophe that threatens the world. And to not only talk but to combine the efforts of states in order to put an end to this dangerous trend. Our countrymen have the right to hope that they will make their contribution to the organization of this common noble mission which meets the national security interests of our own countries. Their priorities must also change in a changing world.

Multilateral Talks on Bering Sea Fishing Begin in Tokyo

LD0108023791 Moscow TASS International Service in Russian 1105 GMT 31 Jul 91

[By TASS correspondent Vladimir Kuchko]

[Excerpts] Tokyo, 31 Jul (TASS)—Multilateral consultations on questions of fishing in the central Bering Sea opened in the Japanese capital today. The participants in the conference—delegations from the USSR, the United States, Japan, the PRC, the ROK, and Poland—are discussing problems brought about by the unregulated fishing of pollack in this region, situated between the economic zones of the USSR and the United States.

“The situation which has developed is causing serious problems for the environment. According to scientific data, as a result of the continuing unregulated fishing, in particular by countries which are not situated in this region, supplies of pollack have more than halved in recent years,” USSR Deputy Fisheries Minister Vyacheslav Zilanov, the head of the Soviet delegation, noted in a conversation with a TASS correspondent. “This may cause serious damage to the economic balance in the Bering Sea and to the population living along the coastlines of the USSR and the United States, whose life support depends on live marine resources.” [passage omitted]

During the second round of consultations—the first round was held in Washington in February—the USSR and U.S. delegations intend to propose a draft international convention on creating the mechanism for protecting live marine resources and their control in the central Bering Sea. Regulations to determine fishing volumes based on scientific research of fish stocks are proposed as a first step.

Australia-France Talks Stress Continuing Cooperation on Antarctic

BK2207062091 Melbourne Radio Australia in English 0500 GMT 22 Jul 91

[Text] Australia and France have concluded talks on global and regional environmental issues. The Australian foreign affairs department said the two days of talks last week in Canberra concentrated on continuing cooperation on protecting the Antarctic environment.

Australia and France cooperated closely in promoting a treaty which imposes a 50-year mining ban in Antarctica. Other issues on the agenda include climate change, biological diversity, and protection of the marine environment.

Australian officials again registered the government's disappointment at the continuing French nuclear testing in the Pacific.

Bank of Tokyo Donates Fund for Environmental Programs in Developing Nations

OW3107132691 Tokyo KYODO in English 1250 GMT 31 Jul 91

[Text] Tokyo, July 31 KYODO—The Bank of Tokyo Group said Wednesday it will donate 1 million dollars worth of credit held by its U.S. subsidiaries to the U.S. Committee of the World Wildlife Fund (WWF) to help protect the environment in developing nations.

The group said 200,000 dollars of the fund will be earmarked for 16 programs for environmental protection in the Philippines, including preservation of forests and coral reefs and in training environmental experts.

How to use the remaining 800,000 dollars will be decided later in consultation with the WWF, the group said.

It said the donation will be made under an international swap scheme under which outstanding debt in developing nations will be transferred to environmental groups for investment on projects to protect the environment in debtor nations.

The environment agency said a total of about 100 million dollars has been used for about 18 projects worldwide under the swap scheme between 1987 and early 1991.

ASEAN Conferees To Discuss Human Rights, Environment

BK1807060191 Kuala Lumpur BERNAMA in English 0359 GMT 18 Jul 91

[Text] Kuala Lumpur, July 18 (OANA-BERNAMA)—Human rights and the environment are among the main issues to be discussed between ASEAN [Association of Southeast Asia Nations] and their seven economic dialogue partners at their ministerial meeting here next week.

The issues are being raised because of ASEAN concern that the Western dialogue partners are moving towards making trade, investment, and economic development cooperation conditional to human rights and the environment.

“There is a tendency for our dialogue partners to link the two issues with economic cooperation and development,” Malaysian Foreign Minister Abdullah Ahmad Badawi told a news conference Wednesday.

At the last ministerial meeting between ASEAN and the European Community (EC) in Luxembourg in May, the EC warned ASEAN that requests for trade and aid could hinge upon their human rights records.

Foreign ministers from the six ASEAN nations are to begin their two-day annual ministerial meeting here on Friday, which would be followed by a three-day meeting with the grouping's seven dialogue partners.

The dialogue partners are the United States, the EC, Japan, Canada, Australia, New Zealand, and South Korea which would be upgraded from its sectoral-level

status now to full dialogue partner status at the ASEAN foreign ministers meeting.

Abdullah said the subject of human rights and the environment was an important one to be dealt with the dialogue partners in what he believed would be an "exciting" discussion. [sentence as received]

"I have a feeling that when we raise the issue of mutual economic and development cooperation with the EC, they will inevitably raise the topic of human rights," he said.

At the Luxembourg meeting, the EC stressed its new policy of linking aid with respect for human rights and democracy, and that it was also increasing environmental protection projects with ASEAN.

Abdullah said ASEAN felt that the link should be a criterion that was not imposed solely on the ASEAN nations.

The ASEAN Standing Committee, chaired by Malaysia, completed its three-day meeting today to draw up the agenda and finalise the draft communique to be studied by the ASEAN foreign ministers at their meeting.

Among the issues to be discussed at the ASEAN Ministerial Meeting are Malaysia's proposal for an East Asia Economic Group (EAEG) and the report by the ASEAN-commissioned group of five eminent persons on recommendations to strengthen the ASEAN structure including the Jakarta-based Secretariat.

The ministers would look at a report on the EAEG prepared by an ASEAN working group on the concept for the grouping and its mutual benefits.

Other issues include establishing an ASEAN cooperation unit to streamline project formulation and implementation, and preparations for the fourth ASEAN summit in Singapore early next year.

At the post-ministerial conference, ASEAN would also raise with its dialogue partners political issues such as the Cambodian peace process, Vietnamese boat-people, and recent developments in Eastern Europe and South Africa especially the United States' recent lifting of sanctions against Pretoria.

Also to be discussed are economic issues such as the Uruguay round of multilateral trade negotiations under the General Agreement on Tariffs and Trade (GATT) and social issues such as the problem of drug abuse.

The ASEAN members would first have a meeting with all seven dialogue countries before breaking off into separate meetings with individual nations.

Referring to the attendance of the Soviet Union and China for the opening of the ASEAN ministerial meeting, at Malaysia's invitation, Datuk Abdullah said ASEAN would also hold separate meetings with both countries on exploring trade and economic opportunities.

China would be represented by Foreign Minister Qian Qichen while the Soviet Union by its Deputy Premier Yuri Maslyukov.

Also attending the meeting are Papua New Guinea in its capacity as permanent observer and Rafeeudin Ahmed, the special representative of the United Nations secretary-general.

EC Denies Setting Human Rights, Environmental Conditions on ASEAN Development Assistance

*BK2407022591 Bangkok BANGKOK POST in English
24 Jul 91 p 24*

[By Bunsong Kositchothethana in Kuala Lumpur]

[Text] The European Community (EC) yesterday said it has no desire to impose conditions on the preferential trade arrangements and development assistance it extends to ASEAN by linking them with human rights and environmental questions.

"We have no desire to impose any 'made in Europe' solution," EC Commissioner Abel Matutes said.

"We only want to share with you our strong belief that economic development, political rights and fundamental freedoms are closely interrelated policies."

Mr. Matutes was speaking to ASEAN foreign ministers at the ASEAN Post Ministerial Meeting, during which ASEAN maintained that the EC should not link human rights and environment issues to economic matters and impose more conditions on the six nations.

A spokesman for the Malaysian Foreign Ministry said ASEAN and the EC yesterday agreed to study the question further.

ASEAN ministers yesterday also had a follow-up discussion with the EC on the subjects of establishing a consultative mechanism to avert ASEAN-EC trade disputes, establishing a comprehensive plan of action for developing industrial cooperation, and involving the European Investment Bank and other financial institutions in financing ASEAN public and private projects and ASEAN-EC joint ventures.

The EC also offered technical assistance on the proposed establishment of an ASEAN Free Trade Area, as was initiated by Thai Prime Minister Anan Panyarachun. ASEAN foreign ministers welcomed the offer.

Meanwhile, the EC has reaffirmed its commitment to complete the stalled Uruguay Round of world trade negotiations before the end of the year.

EC Council of Minister President H. Van den Broek said here that the EC spelt out its intention during the recent meeting in London of the Group of Seven, the world's seven richest countries.

The EC was blamed by the developing countries for contributing to the failure of Uruguay Round of GATT, which was supposed to be wrapped up at the end of last year.

While maintaining that both developed and developing countries needed to be flexible in negotiations, Mr Van den Broek said the EC "is prepared to play its full part in this give-and-take process in conformity with the Declaration of the London G-7 Summit".

PRC's Liu Criticizes South Pacific Forum's 'Two China' Policy

BK0108110091 Hong Kong AFP in English 1052 GMT 1 Aug 91

[Text] Palikir, Aug 1 (AFP)—Chinese Vice Premier Liu Huaiqiu firmly reaffirmed Thursday Beijing's opposition to nations establishing ties with Taiwan, during a speech at the annual post South Pacific Forum meeting here.

Earlier this week the forum effectively adopted a "Two China" policy by admitting only the mainland into its formal dialogue with its main trade and aid partners, but agreeing that the four members who recognized Taiwan may brief Taipei on the proceedings.

Liu said Beijing was committed to peaceful reunification of China under its "one country, two systems" policy, and that changes on both sides of the Taiwan Strait should speed this process.

"China's reunification is an irresistible historical trend, in spite of the fact that the Taiwan authorities are trying to lay all kinds of obstacles and vigorously pursuing so-called 'elastic diplomacy' and 'substantive diplomacy' in an attempt to create 'two Chinas,'" he said.

Liu said increasing exchanges between Taiwan and China were internal affairs and "totally different in nature from the Taiwan authorities' attempt to seek ... relations with countries that have diplomatic relations with (China)."

He said China had ambassadors in nine forum countries and that its ties with the South Pacific region had grown stronger and closer.

Asterio Takesy, external affairs secretary of the Federated States of Micronesia, host of the conference, said forum members took the statement "as a plea," not as a rebuke.

Meanwhile, British Minister of State Lord Caithness said that living standards had declined in the South Pacific over the past 10 years, despite growing aid to the area.

"This is worrying and suggests that all is not well with the assistance process in the region," he said.

The minister said that while Britain did not intend to interfere in the internal affairs of aid recipients, assistance must go only to countries with policies to ensure it would be used effectively.

"Building new classrooms will not improve the quality of education unless well-trained staff, essential books and material, and an adequate curriculum are in place," Caithness said.

"In the past we have perhaps assumed too readily that providing experts, or sending people away for training, or building better schools, will give rise to sustainable development," he said, adding, "we now know that they do not."

"Large amounts of expenditure have sometimes led, unhappily, to small amounts of development," the minister said.

In his statement, Jacques Le Blanc, France's South Pacific secretary, ignored forum criticism of continued French nuclear testing in the region.

He said France wanted to be a "stability factor" in the area by participating in regional bodies through its territories and that it intended to assist the Pacific cause in the European Community.

The French representative said this was part of building a "new partnership," and that economic and technical cooperation with the Pacific was "among the priorities of (France's) foreign policy."

Le Blanc also avoided any reference to a call by the forum that it should be allowed to send an annual delegation to New Caledonia to inspect the French territory's progress towards independence.

He noted that the forum had sent a team earlier this month and said its report had shown how "deeply committed France is in the implementation of the Matignon Agreements", which set out a framework for independence.

In reference to the environmental issues which dominated the forum's communique, Muneo Suzuki, the Japanese vice minister for Foreign Affairs, said Tokyo planned to deal with these problems because it had faced serious pollution in the past.

Suzuki noted also that fisheries were always on the forum's agenda because member nations wanted to develop their own industry and conserve maritime resources, adding that in the 1990 fiscal year Japan had given South Pacific countries almost 23 billion yen (169 million dollars) for fishing projects.

He said Japan was determined to maintain a conservation interest in the South Pacific, while assisting the region's development.

International Conference on Black Sea Held in Republic of Georgia

Conference Begins Work

AU2007110091 Tbilisi SAKARTVELOS RESPUBLIKA in Georgian 13 Jul 91 p 1

[SAKINFORM report: "They Are Discussing the Problems of the Black Sea"]

[Text] Today, 13 July, an international conference devoted to the ecological problems of the Black Sea begins its work in Batumi. The conference has been organized by Georgia's Greens, the Supreme Council of the Republic of Georgia, and the Supreme Council of the Adzharian Autonomous Republic.

The aim of the conference is to coordinate the activities of the greens and environmental protection organizations of the Black Sea states and other European countries in order to focus the maximum attention of world public opinion on the ecological problems of the Black Sea; to get work started at the level of heads of state on the elaboration of appropriate projects and agreements; and to promote the adoption and implementation of ecological legislation on the Black Sea in these countries.

Guests from Bulgaria, Turkey, Romania, the Ukraine, and Estonia are taking part in the work of the conference.

President Gamsakhurdia Urges International Cooperation

AU2007110191 Tbilisi SAKARTVELOS RESPUBLIKA in Georgian 13 Jul 91 p 1

[Message from Zviad Gamsakhurdia, president of the Republic of Georgia: "To the Participants of the International Meeting Devoted to the Problems of the Black Sea"—12 June 1991]

[Text] The Georgian people and the leadership of the Republic of Georgia are extremely concerned about the most serious ecological situation that has been created in the Black Sea. The pollution of the sea from communal and industrial waste, the erosion of the shoreline, the destruction of the sea's ecosystem, and the increase in the nonoxidizing hydrogen sulphide layer have indeed become alarming. We, the Black Sea states and peoples, are faced with the danger that we may lose our common sea as a unique living system.

Those totalitarian regimes that, in the recent past, ruled over almost all the Black Sea states are undoubtedly responsible for the current serious ecological situation in our region. A clear example of this is what has happened in Georgia where the communist approach to the living environment and the ruthless and barbaric exploitation of our natural resources have resulted in a universal ecological crisis in our country.

How can we resolve this problem? First and foremost through international cooperation on a wide scale and through the unification of all our efforts and potentialities. It is a fact that no state on its own can cope with this problem. From this point of view, it is very important that not only the Black Sea countries but also those through which the Danube flows undertake the responsibility, in connection with the situation that has taken shape, to take part in the implementation of international programs.

We attach very great importance to the development of contacts in this direction not only at a governmental level but also at a nongovernmental level such as the participation of social organizations in the formation and implementation of programs of cooperation. It is precisely on this account that we welcome the participants of the meeting in Batumi and express the hope that they will make their own contributions to the mobilization of public opinion and to outlining concrete plans for the future.

Georgia is ready to play host to future international meetings at any level whose aim will be to resolve the problems of the Black Sea and lay the basis for the implementation of concrete initiatives.

We welcome the idea of the Black Sea as a zone of peace, cooperation, and security!

Shevardnadze Proposes International Organization

OW2407083391 Moscow INTERFAX in English 0930 GMT 23 Jul 91

[Following item transmitted via KYODO]

[Text] Former Soviet foreign minister Eduard Shevardnadze who now leads the Soviet Foreign Policy Association has called for creating a working mechanism with corresponding organizational structure designed to coordinate and integrate the efforts of countries belonging to the Black Sea basin with a view to protecting its ecology. He sent messages to the leaders of the Russian Federation, Moldova, Azerbaijan, Armenia and the Ukraine, as well as to foreign countries: Austria, Bulgaria, Hungary, Germany, Switzerland, Turkey, Romania, Greece, Yugoslavia and Czechoslovakia.

The leadership of the Republic of Georgia, Shevardnadze says in his message, is ready to create the necessary conditions for a normal functioning of the proposed international organization.

According to the message, the problem of the Black Sea ecology which is a part of Mediterranean problems is recognized by the world community as an ecological threat challenging humanity as a whole.

A memorandum written by the initiating group for saving the Black Sea's ecological system expresses serious concern about the growing hydrogen sulfide layer in the sea water.

According to researchers, the quantity of hydrogen sulfide in the Black Sea totals some 2 billion tons. The surface of the hydrogen sulfide layer is higher in the center and lower at the coasts. At the coast of the Crimea the surface of the layer lies at a depth of 150 metres, while in the center of the sea it reaches the critical point of 50 meters. The hydrogen sulfide mass is steadily increasing in volume, and this is fraught with the danger of an explosion whose destructive power would be 200 to 300 times greater than that of the blast in Chernobyl.

Participants Comment on Conference

AU2607160291 Tbilisi SAKARTVELOS RESPUBLIKA in Georgian 20 Jul 91 p 3

[Article by SAKINFORM correspondent Guram Gendzkhadze: "The Black Sea: A Cry for Help"]

[Text] A tearful dolphin is raising the alarm: "Help the Black Sea!!!" Participants of the international conference devoted to the problems of the Black Sea held in Batumi look at this poster in anguish. However, it was even more distressing to hear the following kind of remark: "The Black Sea will never be the same as it once was."

It is difficult for a person to reconcile himself to such opinions. Therefore, scientists, specialists, Greens, and other representatives gathered together in order to find a way out of the situation that has taken shape.

The conference was opened by Professor Givi T'umaniashvili, chairman of the Ecological Association of the Georgian Green Movement.

He read out a message from Zviad Gamsakhurdia, president of the Republic of Georgia, to the participants of the conference and a telegram of welcome from the eminent French oceanographer Jacques Cousteau.

A welcome was extended to the participants in the conference and then the following people spoke: Zurab Zhvania, speaker for the Georgian Green Party; Guram Varshalomidze, acting chairman of the Government of Adzharia; Lili Samsonova, chairwoman of the Bulgarian organization "Ecoglasnost"; Guram Mak'atsaria, member of the Republic of Georgia Supreme Council Permanent Commission for Agriculture, Land Utilization, and Ecology; Bilge Janetepe, president of the Turkish Green Party; U.S. representative Matthew Shenski; Irakli Khomeriki, professor at Tbilisi State University; David Nakani, minister of ecology and the utilization of natural resources of Georgia; Vitaliy Kononovi, chairman of the Ukrainian Green Party; and others.

A variety of opinions were expressed on, for example, the problem of hydrogen sulphide in the Black Sea. If it was the opinion of some that the problem was catastrophic and its reduction required human intervention, others, on the contrary, categorically maintained that one should not interfere in natural processes and that the quantity of hydrogen sulphide was no cause for alarm.

All this has once again convinced us that these kind of gatherings of specialists from different countries should be held more frequently. The important thing is to conduct an in-depth scientific study of these problems and resolve them. Let us hear what the participants themselves had to say.

Zurab Zhvania: "The main aim of our work is to direct the attention of the world public to the problems of the Black Sea. It is our intention to organize actions on a large scale involving the participation of representatives of Green parties of different countries. We also expect to organize international meetings of scientists and specialists. One of these will be devoted to the problem of hydrogen sulphide in the [Black] Sea. I believe that we will be able to reach common accord particularly as the first step has already been taken. Many people are worried by the radiation situation in Georgia following the Chernobyl catastrophe. A joint commission will be established in the republic to study this problem. One other thing. A Black Sea Basin coordination center composed of state representatives and Greens under the name "SOS—Black Sea" will be established in Batumi. Aslan Abashidze, acting chairman of the Adzharian Supreme Council, has promised to help us. I am certain that Batumi will occupy a worthy place in the international ecological movement."

Vitaliy Kononovi: "We have the one sea and, therefore, the problems are common to us all. We have to resolve them together. In our country, the Dniepr, Don, and Danube are the principal sources of pollution of the Black Sea. We are demanding the demilitarization of the Ukraine and the Black Sea coastline, the creation of a nuclear-free zone, and the protection of the socially unprotected strata of the population. We are planning to organize a steamboat cruise involving the participation of representatives of Green parties from many countries. A cultural program would be included and one of the first to respond to our invitation has been Tamriko Gverdtsit'eli [famous Georgian singer]."

Lili Samsonova: "It is gratifying to note that Georgia, which is the least responsible for polluting the Black Sea, is showing the greatest concern for its future security. In Bulgaria, ecological institutes have been working on the problems of the state and pollution of the Black Sea for years now. However, data is frequently concealed from the population. Our aim is to convey a truthful picture of the Black Sea's ecological situation to our people and to get the government to implement concrete measures aimed at clearing up the pollution. Today, we have taken the first step; we have discussed the problems together and we are sure to see results."

Ayaz Aidini, deputy chairman of the Turkish Green Party: "This is the first time that I have been invited to participate in a conference devoted to the problems of the Black Sea. I have to say that no country will be able to solve these problems on its own. It is only by uniting forces that we will be able to make progress. The idea of establishing an 'SOS—Black Sea' [coordination center]

was discussed at the conference. I have to point out that analogous centers will be created in Istanbul and Trabzon."

Gia Gvazava, senior lecturer at the Sokhumi branch of Tbilisi State University and chairman of Abkhazia's Green Movement: "The Black Sea is unique but polluted. Therefore, it is not only the water that is a danger to man but also the sea's fish. For example, the Greeks wanted to fish for the katrana Black Sea shark but when they ascertained that it contained harmful chemical substances in excess of the accepted norm, they abandoned their intention and did not sign the agreement with the Soviet Union. Also, our fishermen use the bottom trawl to catch demersal fish—salmon and sole—that are likewise dangerous to eat. The point is that, following the accident at the Chernobyl Atomic Power Plant, certain regions of the Black Sea have become "sick" with radionuclides that have gradually settled on the seabed. In connection with this, I proposed at the conference that

a ban on fishing be imposed for at least two years in Georgian territorial waters."

Merab Kut'ubidze, chairman of the Batumi Green Movement: "We submitted many proposals at the conference of which I will single out the following: The creation of a special parliamentary commission to study those questions connected with the financing of ecological measures. I believe that our proposal has been supported."

The conference adopted a resolution.

The participants of the conference went out into the streets of Batumi and, finally, a meeting was held at which such slogans as "let's protect the environment" were heard.

A group of participants in the conference were received by Guram Varshalomidze, acting chairman of the Government of Adzharia.

REGIONAL AFFAIRS

SADCC Countries To Cooperate on Wetlands Conservation

91WN0569A Luanda JORNAL DE ANGOLA
in Portuguese 13 Jun 91

[Text] Harare (From the ANGOP [Angolan Press Agency] bureau)—The Southern Africa Development Coordination Conference (SADCC) may soon create a technical unit for the so-called "wetlands."

A decision to this effect is likely to be made during the SADCC ministerial meeting scheduled for this October in Malawi, the country that coordinates the fish and wildlife sector within that organization.

The recommendation to create such a technical unit was made at an SADCC conference held on 3-6 June in Gaborone, capital of Botswana, and attended by 20 delegates and researchers from the ten SADCC member countries.

Financed by NORAD [Norwegian Agency for International Development], the meeting was sponsored by the International Union of Nature and Resources Conservation (UICN), a nongovernmental organization based in Geneva that has 60 member countries and has established its regional bureau for Southern Africa in Harare, capital of Zimbabwe.

At the meeting, which was also attended by 27 observers and delegates from several international organizations, Angola was represented by Fernando Mesquita, assistant national director of the forestry development institute, and Adelino Rodrigues, head of the wildlife department of this institute, which is part of the Ministry of Agriculture.

The Gaborone meeting, which provided the first occasion for a discussion of the topic of wetlands conservation in the SADCC, recommended that a survey be made of all zones of this type located in the organization's member countries, and that national organizations responsible for protecting them be created.

Wetlands are of particular importance to SADCC countries, most of which are endowed with a great potential in terms of water resources. Rational use of this water could help develop their economies, especially agriculture, forestry, wildlife, and fishing.

To Botswana, a country with vast arid areas, conservation of the Okavango delta plays a significant role in the development of its agriculture. The delta receives the waters of the Kubango River, which start in Angola and then crosses the Caprivi panhandle in Namibian territory before entering Botswana.

Rational use of the mangroves (aquatic plants also called "mangais"), is of key importance to Mozambique, since

mangrove is the source of the organic material needed for raising shrimp, that SADCC country's principle export product

The meeting noted the need to initiate a more extensive exchange of information, data, and consultations on wetlands conservation for the sake of economic development and tourism.

Although the subject of wetlands is practically unknown in the region to date, their importance demands coordination within the SADCC if better control over conservation of swamps is to be achieved.

That is why the SADCC countries need to undertake additional exchanges of information by creating a regional center devoted to wetlands monitoring, with a view to achieving better results in their conservation and maintenance in the future.

Personnel training and an effort to strengthen legislation on this subject were also recommended at the Gaborone meeting, which decided to submit a wetlands conservation program for the SADCC countries at the next ministerial conference. Among the measures that would be included in such a plan are an increase in research, planning, management, and education in this field.

KENYA

Thika River Industrial Pollution Noted; Controls Urged

91WN0561A Nairobi SUNDAY TIMES in English
9 Jun 91 p 3

[Excerpts] Chemical-contaminated water from several industries in Thika town threatens marine life in the hydroelectric dam along the Tana River, Thika mayor, Councillor Douglas Mundia has said. [passage omitted]

Mayor Mundia said the Thika River, a tributary of the Tana River, that flows through the town, was being polluted by some of the town's major industries that had not heeded the call to treat the effluent before emitting it to the river. The mayor warned such firms that they risked closure of their factories.

He said the Government had spent millions of shillings to construct the dam and, therefore, called on factories in the town to ensure waste water was treated before it is released to the river.

He also appealed to the Government to speed up the opening of the factory inspectorate office in the town to assist his council to detect increasing cases of water and environmental pollution.

Mayor Mundia assured industrialists that his council was not against any individual factory, but expressed concern that factory owners had repeatedly been advised by environmental experts and provincial administration on environmental safety but had not heeded the advice.

Councillor Mundia also revealed that his council was purchasing a Sh100,000 air detecting machine in line with Government policy on environmental conservation.

NIGERIA

Government Plans To Register Dual-Purpose, High-Risk Chemicals

*AB0208102591 Lagos Radio Nigeria Network
in English 1800 GMT 31 Jul 91*

[Wole Abioye commentary]

[Text] Coming at a time when environmental pollution is assuming a disturbing dimension, the plans to set up a registry on dual-purpose and high-risk chemicals in the country are most welcome. As the minister of defense, Lieutenant General Sani Abacha, explained, the proposed registry will keep a tab on chemical industries and conduct a national trial inspection to ascertain lawful needs before signing the United Nations Chemical Weapons Convention. The dual-purpose chemicals are used both in industrial and chemical weapons production.

At a seminar in Lagos, the minister of defense spoke of Nigeria's commitment to a comprehensive, effective, and veritable ban on chemical weapons. This is without unnecessary hindrance to international trade and the use of chemicals for legitimate civilian purposes. The United Nations concluded the chemical weapons convention in response to the flagrant violations of the general protocol of 1925 and the arbitrary use of chemical weapons. Chemical users are not necessarily the producers.

There is, therefore, good sense in the suggestion by the defense minister that a multilaterally negotiated convention should be adopted on the total ban of the development, production, and stockpiling of chemical weapons. The destruction of such weapons should be similarly negotiated. At the same time, on-the-spot checks must be allowed to ensure equal international compliance and standards.

One of the implications of the chemical weapons convention is that the ban may restrict the importation of chemicals used in the pharmaceutical, agro-allied, and other relevant subsectors of the economy. Chemical industries in the country must be sufficiently aware of this. Whenever the restriction on dual-purpose chemicals is imposed, it must be seen to be enforced internationally.

Nigeria should reject any country's unilateral export control that may hinder our national development and economic self-reliance. In the quest for self-reliance, it is expedient for Nigeria to be inward-looking in the development and production of chemical that suit her economic needs.

The days of indiscriminate importation of high-risk chemicals should come to an end. With the setting up of the Federal Environmental Protection Agency, FEPA, we have joined the race to make our environment secure and safer for human, animal, and plant life.

There is, therefore, an urgent need for meticulous monitoring of industries that use chemicals and cause environmental degradation. This is quite necessary because industrial pollution continues unabated despite the national guidelines on its control. All industries must be subjected to thorough inspection by the agency to ascertain their compliance with the guidelines, identify coverage, and impose appropriate legal sanctions.

SOUTH AFRICA

Cape Town Pollution Levels Exceeding Accepted Levels

*MB1707173891 Johannesburg SABC TV 1 Network
in English 1545 GMT 17 Jul 91*

[Text] A thick layer of smog had Capetonians coughing and spluttering this morning, as pollution exceeded internationally accepted levels by 30 percent. The level of oxide pollution measured today was one of the highest in the city this winter.

[Begin recording] [Reporter Karen van Essen] The blanket of smog stretched for miles across the Cape peninsula. From Signal Hill, all we could see in places were a few tall chimneys sticking out above the smog. The only cure is the Cape Doctor, the south-easter which blows mainly in summer. It is on wind-still days like this that the pollution is particularly obvious, and the problem is getting worse all the time. The main cause of the smog is exhaust fumes from cars, trucks, and buses, and with the steady increase in traffic, pollution levels in Cape Town have risen dramatically over the last three years.

[Dr. Michael Popkiss, Cape Town Medical Officer of Health] Yes, I think so. What we have at the moment is evidence that over the past few years we've had an increase in the number and in the severity of episodes of visible pollution in Cape Town, and we are concerned that this is part of a long-term trend, which could mean a serious problem in the future. That is why we feel the time to act is now.

[Van Essen] Meanwhile, the city council has budgeted 150,000 rands for new equipment to monitor the pollution levels, and to help provide more accurate research data. [end recording]

Quebec Poll Finds Environmental Safety Favored Over Economic Development

91EN0661B Montreal *LA PRESSE* in French 1 Jun 91
p A-2

[Article by Paul Roy: "Environmental Quality Tops Economy for 53 Percent of Quebecois"]

[Text] A majority of Quebecois appear to differ with the view held by Energy Minister Lise Bacon, who feels that it is time "to quit being adolescents concerning the environment."

A CROP-LA PRESSE poll finds that 53 percent of the Quebecois feel that the carrying out of major economic development projects involving dangers to the environment should be forbidden, "even at the risk of compromising economic development and the creation of jobs."

Question: In general, what is your attitude toward major economic development projects involving risks for the environment or the common patrimony?

Answer	Percent
They should be FORBIDDEN, even at the risk of compromising economic development and the creation of jobs	53
They should be PERMITTED, even if they involve risks for the environment or the common patrimony	34
Do not know	13

Conversely, 34 percent of those polled favor the carrying out of such projects, "even if they involve risks for nature or the nation's common patrimony." The other 13 percent do not know or have no opinion on the issue. This poll was taken among 1,040 Quebecois between 23 and 25 May. Mrs Bacon's statement dates back to 22 May. Expressing her objections to a decision against the Soligaz project, by the Bureau of Public Hearings on the Environment [BAPE], she stated on that date that the quest for a "zero effect" on the environment will end up also producing a "zero effect" on the economy.

According to our poll, 62 percent of the Quebecois further feel that the importance being given to protection of the environment and of the national patrimony is not sufficient; 27 percent feel that it is sufficient; and 7 percent, that it is excessive.

A greater sensitivity to this issue is found among women, the younger sector, and non-Francophones. Thus, 67 percent of the women, but only 56 percent of the men, feel that the importance being given to the environment is not sufficient. Between non-Francophones (75 percent) and Francophones (59 percent), the gap is even more considerable. And it is even more so between the young 18-34 age group (69 percent) and the "older" 55-and-over group (48 percent).

Do the Quebecois trust Hydro-Quebec "to develop major hydroelectric projects in the interest of the Quebecois?" Yes, say 64 percent; no, 31 percent.

Do they trust the big state-owned corporation "to develop major projects with all due protection of the environment?" Here again, the yes response (63 percent) exceeds the no's (34 percent).

Question: Are you very satisfied, rather satisfied, rather unsatisfied, or totally unsatisfied with Hydro-Quebec as regards (in percentages):

	Satisfied	Not Satisfied	Do Not Know
Service to its customers	80	10	10
Repairs of malfunctions	80	17	4
Planning and carrying out of major hydroelectric projects	57	26	17
Protection of the environment	57	32	11
Electricity rates	30	64	6

Considerable gaps are still noted in the responses to these two questions, however, as between Francophones and non-Francophones. The Francophones trust Hydro-Quebec on these two points in the proportions of 67 and 65 percent respectively; the non-Francophones, 48 and 47 percent respectively.

Opinions are approximately equally divided on the question of whether the sale of electricity to the United States will or will not diminish Hydro-Quebec's capacity for satisfying Quebec's future needs. The view that it will diminish that capacity exceeds but slightly the view that it will not, the ratios being 47 and 44 percent respectively, with 9 percent expressing no opinion on the issue. The same question posed in January 1989 drew the following responses respectively: 50, 35, and 14 percent.

Question: Hydro-Quebec is signing secret agreements and is granting rebates to firms that consume large quantities of electricity and wish to install operations in Quebec, and to American states. Do you entirely agree, rather agree, rather disagree, or entirely disagree (in percentages):

	Agree	Disagree	Do Not Know
That Hydro-Quebec should grant rebates to certain big customers	38	58	3
That Hydro-Quebec should sign secret agreements	21	76	4

How the Poll Was Taken

The findings of this poll are based on 1,040 telephone interviews conducted from 23 to 26 May 1991.

The interviewees were chosen at random with the aid of a selection grid that takes into account the number of adults in multiple-member households, their sexes and ages. The sample of households was drawn from the published telephone subscriber lists for Quebec as a whole, by the systematic randomization method. For purposes of sampling, Quebec was divided into three

regions: metropolitan Montreal, metropolitan Quebec, and the rest of the province.

The cooperation rate in this poll was 70 percent.

During compilation, the results were weighted on the basis of the official statistics, so as to reflect the distribution of Quebec's adult population from the standpoint of interviewees' sex, language normally used, and region of residence.

From a statistical viewpoint, a sample of this size ($n = 1,040$) is accurate to within approximately 3 points, 19 times in 20. It is to be remembered that the margin of error tends to increase when the results are related to subgroups of the sample.

*Claude Gauthier
Vice president and director of research*

State Director Analyzes Environmental Protection Investments, Policies

91WN0543A Beijing HUANJING BAOHU
(ENVIRONMENTAL PROTECTION)
in Chinese Nos 4 and 5, 25 Apr 91, 25 May 91

[Article in three installments by Qu Geping [2575 2706 1627], director of the State Environmental Protection Bureau: "Basic Analysis and Assessment of China's Environmental Protection Investments and Policies"; Part I published in JPRS-TEN-91-014, 9 Jul 91, pp 30-36]

[Part II, 25 Apr 91, pp 2-6]

[Text]

III. Benefits of Investment in Environmental Protection

The effects of investments in environmental protection on the environment can be distinguished by the direction of their utilization, the actual control capacity formed, and the results of control.

Environmental protection investments during the Sixth Five-Year Plan and Seventh Five-Year Plan were used mainly in the two areas of waste water control and atmospheric pollution control. The total for these two areas accounted for more than 70 percent (Tables 3 and 4). Investments in industrial pollution control far exceeded investments in urban environmental construction (Table 5). Investments to control old pollution sources have consistently exceeded investments to control new pollution sources. However, the latter has grown very quickly over the past several years, indicating that as "old accounts" are paid off, the tasks involved in controlling new pollution sources are becoming heavier (Figure 8), which also shows that there have been relative guarantees for investments in "new, upgrading, and expansion" environmental protection projects.

Table 3. Capital Utilization for Environmental Protection During the Sixth Five-Year Plan

Item	Waste water control	Atmospheric control	Waste residue utilization and processing	Noise control and other
Investment (billion yuan)	6.66	6.02	1.95	2.36
Proportion of investments (percent)	39	35.5	11.5	14

Table 4. Capital Utilization for Environmental Protection During the Seventh Five-Year Plan

Item	Waste water control	Atmospheric control	Waste residue utilization and processing	Noise control and other
Investment (billion yuan)	12.5	13.225	2.9	4.7
Proportion of investments (percent)	37.49	39.72	8.69	14.10

Table 5. Investments in Industrial Pollution Control and Urban Environmental Construction (billion yuan)

Period	Industrial pollution control	Urban environmental construction
Sixth Five-Year Plan	12.0	5.0
1986-1989	25.442	11.449

As investments in environmental protection have increased, there have been significant improvements in waste water, waste gas, waste residues, noise, and other control capabilities. Control rates, comprehensive utilization rates, and standards attainment rates for the "three wastes" have all shown a tendency to increase (Figures 9, 10, and 11). Corresponding to this, there has been a reduction in the rate of increase of industrial discharges of waste water and a substantial reduction in discharges of mercury, cadmium, beryllium, chromium, and other heavy metals. There were either no major changes or slight increases in the amounts of industrial dust and sulfur dioxide discharged (Figures 12, 13, and 14).

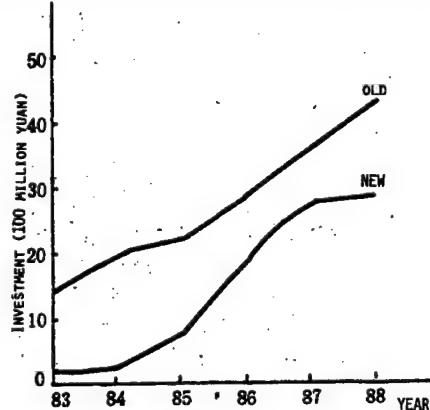


Figure 8. Changes in Investments To Control New and Old Pollution Sources

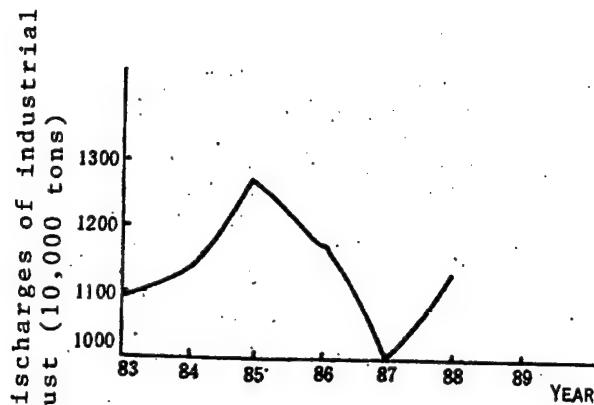


Figure 9. Changes in Discharges of Industrial Dust

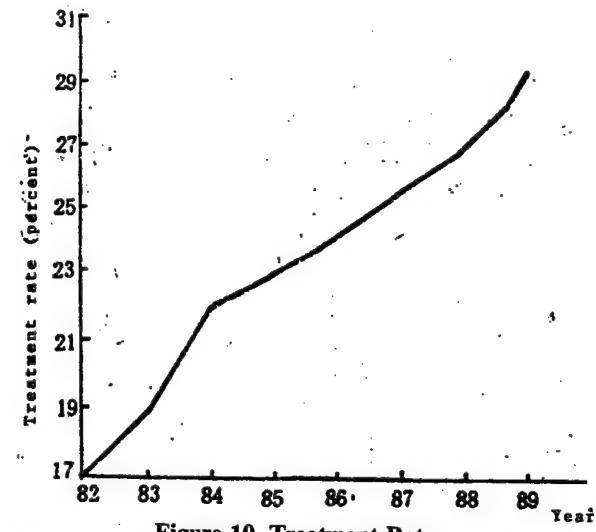


Figure 10. Treatment Rates

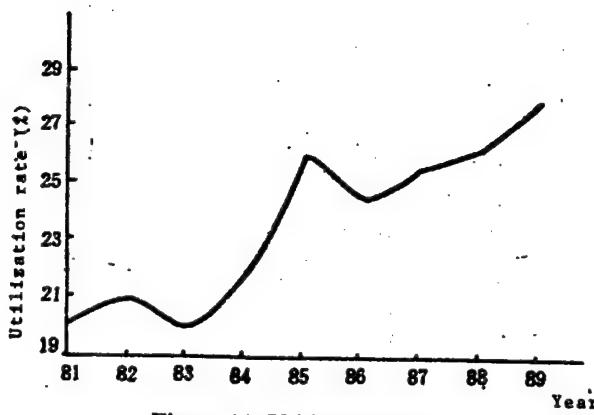


Figure 11. Utilization Rates

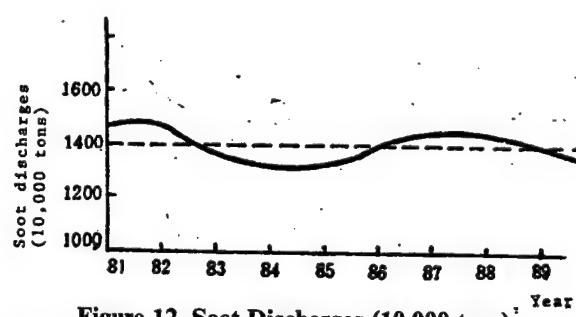


Figure 12. Soot Discharges (10,000 tons)

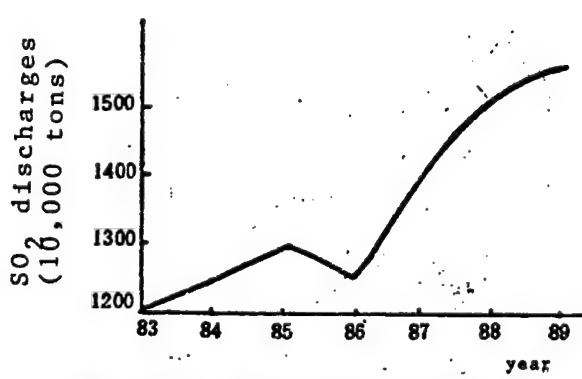


Figure 13. SO₂ Discharges (10,000 tons)

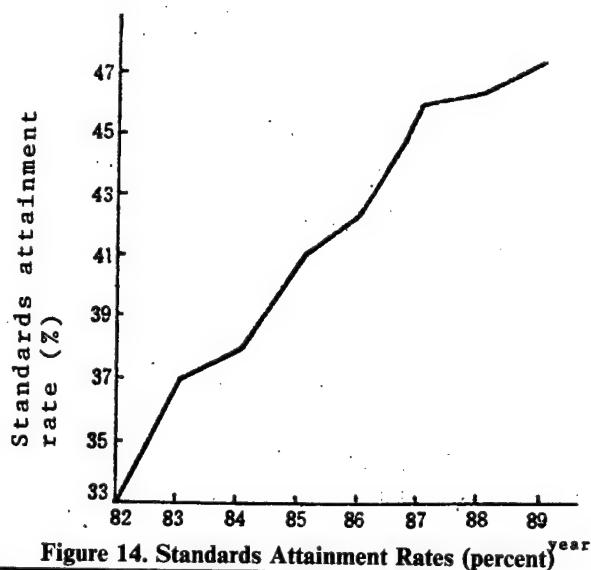


Figure 14. Standards Attainment Rates (percent)

Statistics from key cities indicate that in a situation of substantial growth in the value of industrial output, primary indices for the atmosphere and bodies of water held steady at 1980 levels. This shows that environmental protection investments play a positive role in preventing industrial pollution and controlling degradation of urban environmental quality.

However, we should also note in another area that limited investments in environmental protection have still not produced the results they should have. A national survey of operating conditions at industrial waste water treatment facilities indicates that of the 5,556 waste water treatment facilities in the 22 provinces and municipalities surveyed, 32 percent of the facilities were abandoned, idle, shut down, or otherwise entirely inoperational while 68 percent were operating. The overall effective investment rate for facilities in operation was just 44.9 percent. This means that among the operating treatment facilities, less than half of the total investment in operating facilities was effective investment capable of achieving the expected investment objectives. Taking the investments in the 32 percent of the treatment facilities which were not in operation, the overall effective investment only amounted to 31.3 percent of the total investment. The returns to investments in waste gas, waste residue, noise, and other realms in all areas were less than ideal. Many factors affect investment results, such as too-low pollution discharge fee standards so that enterprises are willing to pay and unwilling to start up treatment facilities; the choices of technology were inappropriate, with some immature technologies being pushed into operation and others being so backward that they did not meet requirements even after treatment; some regions have inadequate power supplies and waste treatment facilities are often made the targets of power restrictions. Moreover, enterprise environmental management is imperfect, systems are irrational, and so on. Ineffective environmental management is a major factor, however.

Overall, in a situation of insufficient investments and low investment results, significant achievements have been made in industrial pollution control and preliminary control has been achieved over rapid degradation of urban environmental quality. A major objective basis for achieving this has been our relatively full use of the favorable conditions in the "initial stages" of economic development in which environmental control funds are relatively low. In many situations, stronger management, establishment of strict systems of regulations, and rather small investments to upgrade industrial processes and equipment can substantially reduce discharges. This situation has compensated to a considerable extent for the unfavorable condition of insufficient investments. However, this sort of potential which can be utilized will gradually be reduced and insufficient investments and poor results will have even more serious effects.

IV. Environmental Protection Investments Should Be Increased and Can Be Increased

To the end of this century, the overall objective in environmental protection is achieving basic control of environmental pollution, making some improvements in urban environmental quality, reducing the trend toward degradation of the natural ecology, gradually achieving coordination of the environment with economic and social development, and laying a foundation for attaining China's long-term goals of benevolent ecological cycles and a clean, beautiful, and quiet urban and rural environment.

To achieve the objective of basically controlling environmental pollution, we must invest about 260 billion yuan in environmental protection from 1986 to 2000, equal to 1 percent of our GNP over the same period. Calculations show that this would not affect economic development and it could give consideration to environmental protection.

As for the structure of the investment, it will cost about 110 billion yuan to control water pollution, about 90 billion yuan to control atmospheric pollution (including coal-formed gas, central heating, coal molding, and desulfurization of thermal power plant flue gas), about 30 billion yuan for solid waste treatment, about 20 billion yuan for noise control, and about 10 billion yuan for self construction.

During the Sixth Five-Year Plan, China's environmental protection investments totalled 17 billion yuan, with 12 billion yuan or 71 percent for industrial pollution prevention and 5 billion yuan or 29 percent for urban environmental improvement. These two items accounted for 0.56 percent of our GNP over the same period. From 1986 to 1989, China invested about 36.8 billion yuan in environmental protection, including 25.4 billion yuan or 69 percent for industrial pollution prevention and 11.4 billion yuan or 31 percent for urban environmental improvement. These two items accounted for 0.7 percent of our GNP over the same period. Looking at the situation during the Sixth Five-Year Plan and first four years of the Seventh Five-Year Plan, there is still a considerable discrepancy compared to the investments proportions required in stipulations.

Investments in environmental protection during the Seventh Five-Year Plan are expected to reach 47 billion yuan. If we assume that investment costs remain the same, one could expect that 220 billion yuan in investments will be required from 1990 to 2000. If environmental protection investments are maintained at around 10 billion yuan a year during the Eighth Five-Year Plan, they would have to reach 34 billion yuan a year during the Ninth Five-Year Plan. This substantial increase obviously is impossible. To reduce the investment pressures during the Ninth Five-Year Plan, we must try to increase the amount of investments during the Eighth Five-Year Plan.

Examination of the plan implementation situation since the 1980's shows a very large shortage of investments. If we fail to find ways to compensate for this shortage of investments, it will be impossible to achieve our planning objectives for the end of this century. What, then, are the measures to adopt? One is to open up and make full use of existing capital channels. A second is to open up new sources of environmental protection investments.

Several problems exist to varying degrees in all eight existing capital channels and there is potential that can be exploited in all of them. Below, I will focus on analysis of the four main channels among them.

Environmental statistical data show an implementation rate of nearly 100 percent for the "three togethers" in large and medium-sized capital construction projects in China at the present time and an implementation rate for small-scale projects of about 80 percent. However, the proportion of "three togethers" environmental protection investments is too low. Environmental protection investments for new construction projects during the first four years of the Seventh Five-Year Plan accounted for about 4.5 percent of total basic investments, a total of 10.2 billion yuan, which was far from capable of attaining the goal of effectively controlling new pollution sources. A survey of five departments indicated that the proportion of capital construction investments used for environmental protection were: metallurgical 6.1 percent, chemical 6.1 percent, nonferrous metals 8.4 percent, machinery 2.7 percent, and aviation 1.4 percent. At this investment rate, most environmental pollution indices failed to attain pollutant discharge standards stipulated by the state and local areas. Typical surveys of several industries in China and experiences in foreign countries show that the proportion of China's industrial capital construction investments that are invested in environmental protection also include the environmental protection investment portion of transformation and expansion projects, which also should be increased substantially to more effectively control growth of pollution. In view of China's present economic support capabilities, controlling the proportion of investments in environmental protection at less than 10 percent of total investments in capital construction is appropriate. This proportion would not affect economic development but could reduce resource and energy consumption and promote economic development. If the proportion of environmental protection investments in industry is increased from 4.6 percent to eight percent during the Eighth Five-Year Plan, it could reach 5.5 billion yuan per year, and as total capital construction investments increase, environmental protection investments would also increase substantially. The present investment situation reflects the fact that we still have major shortcomings in the area of environmental supervision and management,

and in particular our need to make major improvements in environmental standards work. Moreover, Western countries have all implemented preferential policies for environmental protection investments like low-interest loans, specific tax reductions and exemptions, implementing special depreciation for control equipment, and so on. China should also implement similar policies, such as reduction and exemption from energy resource and communication taxes, implementing loan interest subsidies, and so on. This could encourage enterprises to make investments and increase the amount of environmental protection investments that are actually utilized. We did have several preferential policies during the 1970's but they were not implemented very well.

Capital equal to no less than seven percent of renewal and upgrading investments should be set aside for environmental protection. This is an explicitly ordered policy of the state. However, this policy has never been truly and conscientiously implemented. The proportion of environmental protection capital as a part of renewal and upgrading investments has fluctuated at about 1.3 percent for the past several years and only a few industries and enterprises have attained or even surpassed the stipulated levels for environmental protection investments. Because the proportion of environmental protection investments is too low, the objective of using technical upgrading to control pollution could not be achieved. Because there are substantial imbalances in the proportion of environmental protection investments actually required for each type of industry, and as economic reform has occurred, major changes have also taken place in administration of renewal and upgrading capital. Centralized administration by government economic departments at all levels has been changed to administration by enterprises or industries. There is no way to make adjustments among different departments within the same region and enterprises use it along with other capital and it is sometimes difficult to handle it separately. Thus, corresponding readjustments also must be made in this policy stipulation because otherwise the proportion will not meet the stipulated requirements. When implementing this policy, we must emphasize focal points and provide differential treatment. If there are strict requirements for industries and enterprises that are heavy polluters and somewhat more relaxed ones for regular industries, there would be a substantial increase in the amount of funds. Based on 1998 renewal and upgrading investment levels, the total amount of investments in environmental protection could surpass 7 billion yuan and these funds would increase as total investments in renewal and upgrading grew. We should survey the proportions of investments in renewal and upgrading that are going to environmental protection investments for each industry and propose policy stipulations that conform to actual conditions in each department and each industry. At the same time, we should reinforce program guidance, supervision, and inspection of investments.

Table 6. Renewal and Upgrading Capital Used for Environmental Protection

Year	1985	1986	1987	1988
Renewal and upgrading capital that should have been used for environmental protection (billion yuan)	3.144	4.334	5.310	6.864
Renewal and upgrading capital actually used for environmental protection (billion yuan)	.604	.827	.989	1.213
Difference between two items (billion yuan)	2.540	3.507	4.321	5.651

Pollutant discharge fees are one capital channel that has been implemented to a greater extent at the present time, but many problems also exist. Estimates indicate that China should collect about 2 billion yuan in pollutant discharge fees each year based on current fee collection standards but the total actually collected at present is actually just 70 to 80 percent of the amount that should be collected, so there is still definite potential. Moreover, pollutant discharge fee standards are too low. Added to rising materials prices, it is now hard for pollutant discharge fees to play a role in encouraging enterprises to control pollution. Thus, China's pollutant discharge fees should be increased to make enterprises understand that preventing pollution is more economical than paying pollutant discharge fees. Fee collection standards must be increased substantially to take this step. What should be the basis used to determine pollutant discharge fees? First, they should include the cost of preventing and controlling pollution (amounts allocated by year according to different conditions in each industry and sector); second, they should include the operating costs of pollution prevention facilities. At present, because of economic difficulties, there would be problems if fee collection standards were raised too high, so they can be raised gradually to attain reasonable goals. Recently, plans were made to raise fee collection standards an appropriate amount following discussions with the relevant departments. Based on the readjusted standards, the plan for 1988 could reach 2.3 billion yuan.

In addition, when using the capital from pollutant discharge fees, it is best not to re-adopt the principle of stimulating polluters to control pollution in all cases. Different principles for utilization should be proposed according to circumstances. For pollutants which can be treated in a centralized way, centralized treatment arrangements should be advocated. Fee collection standards should be formulated according to the cost of centralized treatment (including the investment and operating costs of pipeline networks and treatment facilities). This is an important source for raising centralized prevention funds.

Investments within urban construction funds that are used for environmental protection and improvement are an important category of investments that are second in amount only to capital construction environmental protection investments at present with a capital proportion that has been maintained at roughly 25 to 30 percent of urban construction funds. It was about 2.5 to 3 billion yuan each year during the first four years of the Seventh

Five-Year Plan. Looking at the current situation, with stable growth in local financial income, this category of investments can continue to increase. In the financial systems of Western nations, one important function of local finances is construction of basic urban government facilities, with some subsidies also being provided to local areas from state finances, but local finances usually occupy the primary status. There are considerable differences between China's financial system and those of Western nations. Besides the public financing functions in each country, they are also responsible for very heavy economic construction tasks and expenditures used for production account for a very large proportion of state financial outlays. Moreover, in regard to the structure of financial income, central financial income as a proportion of GNP has gradually declined, from 31.2 percent in 1978 to 17.5 percent in 1985, so as a result we still rely mainly on local finances and capital raised by society to solve the capital problems of urban environmental construction. In the present economic situation, there are considerable shortages of capital at all levels of financial administration, but as the economy gradually stabilizes and recovers, the financial situation will gradually improve and there will be a corresponding increase in the capital used for urban environmental construction. For the past several years, it has grown at a rate of several 100 million yuan a year and this sort of growth trend will continue.

These four categories of capital alone amount to almost 18 billion yuan a year and account for slightly more than 1 percent of our GNP. If the proportions of these four categories of environmental protection capital remain unchanged during the Eighth Five-Year Plan and Ninth Five-Year Plan, as the economy continues to develop, there may also be a rather substantial increase in the total investment and the index of needing to invest 20 billion yuan a year is attainable.

Besides these capital channels, bank loans are another important component of environmental protection investments and there have been some increases in this area in recent years. This portion of the investments is usually used together with environmental protection investments for the "three together" and technical upgrading as described previously. At present, consideration can be given to using a portion of the income from fee collection, that is environmental protection subsidies, as interest deduction capital to encourage enterprises to use bank loans for pollution prevention and expand the amount of bank loans used for environmental protection.

There is also definite potential for environmental investments in other areas but the total amount is not great.

International grants and loans are another important source of investments but they involve considerable uncertainty.

The international environmental protection situation has developed very quickly over the past several years and the role of international society in promoting the solution of environmental problems in all countries has strengthened. China has still not adopted substantial measures concerning SO₂, NO_x, CFC, CO₂, and other regional and global environmental questions but China wanted to take real action quite early. This requires raising a considerable amount of capital. Internationally, the principle of "the user paying" has been proposed at the present time, which means that all those who utilize environmental resources and endanger the environment must pay the corresponding compensation expenses. Based on experiences in several countries, one feasible method is to collect additional taxes on product fees or pollution, such as a CFC tax, SO₂ tax, CO₂ tax, industrial and household garbage tax, and so on. A special fund is established on this foundation. For SO₂, for example, it can be based on the sulfur content of coal, crude oil, and other energy resource fuels and a sulfur tax collected at marketing links. This money would be used to establish a special acid rain prevention fund. If we can open up our ideology in this area, there is much that can be done and we can get out of the difficult straits of insufficient environmental capital and find reliable sources of funds. When solving several common environmental problems that the world is facing, we can also receive international assistance. For example, at the International Conference on Protection of the Ozone Layer held in London recently, the developed nations agreed to subsidize the establishment of a foundation. If China signs the new protection treaty, we could receive \$40 million in "startup funds" at the outset. There is great possibility for opening up domestic and international capital channels to aid in solving global environmental problems and we should conscientiously study them and use them well.

Furthermore, as reform of the environmental protection investment system unfolds, we should gradually establish environmental protection funds and continually perfect them. In this way, recovery of the principal and interest income for fund loans will form considerable capital.

In general, further opening up of channels and making appropriate readjustments to achieve the investments required for environmental protection objectives is entirely possible. It is possible to strive for 15 to 20 billion yuan yearly in environmental protection investments during the Eighth Five-Year Plan. On the one hand, this depends on an improvement in our national economic situation, and on the other hand and even more directly, it depends on further reinforcement of our environmental management work.

[Part III, 25 May 91, pp 2-4]

[Text]

V. Basic Ideas for Dealing with Environmental Protection Investments

Practice over the past 10 years has proven that our implementation of four major environmental protection policies involving a focus on prevention, those who do the polluting being those who control it, and reinforced environmental management along with the corresponding set of environmental protection investment policies were correct. The basic idea behind this policy is that, given the relatively weak economic strength of the state, the main thing is not to rely on central finances for money but instead to rely on reinforcing environmental supervision and management and using legal, economic, and administrative measures to encourage and induce enterprises, departments, and local financial administrations as well as all parts of society to increase capital inputs into protecting the environment.

At the same time, the preceding analysis also shows that although our ideas were correct, environmental protection investments face the problems of insufficient amounts, low proportions, and poor results. This shows that we have several defects in our environmental management that need improvement. I feel that we should work on these four areas: formulating matching economic policies, improving environmental planning and standards work, reforming the environmental protection investment system, and reinforcing supervision and management of environmental protection investments. I will offer some preliminary views concerning each issue.

A. The question of formulating matching economic policies

The current situation shows that the capital channels previously determined were stipulated only in principle and lack concrete policy stipulations that can be implemented, supervised, and inspected, which means that they lack operability. For environmental protection investments with very strong public welfare qualities, we also lack concrete policies for economic preferences.

Past experience shows that formulating and implementing economic policy is extremely arduous and painstaking work that requires a great deal of survey research and demands patient and intensive work in all departments, especially in comprehensive economic departments. At present, in regard to the issue of investment channels and preferential investment policies, we must first provide a feasible policy program that can be tested and inspected and change the phenomena of unclear policy boundaries and difficulty in operation. The feasibility and economic rationality of every concrete program must be clear and the work of relevant departments must be done in preparation and persuasively. For example, concerning the question of environmental protection investments as part of the "three togethers" and renewal and upgrading capital, we must

be clear about what is environmental protection investment and what is not environmental protection investment and there must be clear boundaries. On this basis, we should propose rational investment proportions for each industry and formulate concrete supervision and examination methods and have economic punishment measures for those enterprises which do not attain investment proportions and environmental standards.

Before the state has made unified stipulations, all areas can take the first step and accumulate experience.

B. Improving environmental planning and standards work

There are defects in China's environmental planning work. One is the absence of a concrete, clear, and operable index system with more principle requirements and fewer quantitative indices, which makes implementation and inspection difficult. The second is it has not properly permeated national economic and social development planning and the programs and plans in the related departments. The third is a detachment of planning objectives from the required capital, so that there are requirements without capital guarantees. To do good planning work, we must strive in three areas. Two types of work must be done to include environmental plans in state and local economic and social development plans. One is to include several important environmental indices among comprehensive indices in economic and social development of people's governments at all levels. These indices should be concrete, clear, and easy to inspect. At the same time, environmental requirements should be used as a condition for comprehensive balance. The second type of work is to include important environmental protection projects in the capital construction and technical upgrading project plans of planning departments and implement capital. The Eighth Five-Year Plan is now being compiled and we are now negotiating with the State Planning Commission and hope that breakthroughs will be made in this area.

Concerning implementation of plan capital, we have a great need to study concrete measures and methods for integrating planning with management work to attain unified planning and utilization of environmental protection capital, make planned arrangements for investments under centralized control, and carry out administrative regulation of scattered investments.

Environmental standards are our enforcement yardstick, an important basis for achieving plan objectives, and an important measure for raising the needed environmental protection investments. There have been major advances in standards work over the past several years, but the problem is that standards are not matched up and there are no standards in many areas, and there is inappropriate leniency and strictness, mainly involving inadequate technical economics analysis when formulating standards, especially inadequate economic analysis. These problems should attract the attention of the

State Environmental Protection Bureau and environmental protection bureaus in all provinces, municipalities, and autonomous regions, which should make standards work an important aspect of daily work and deal with them conscientiously.

Previously, we discussed the channels and possibility of increasing environmental protection investments. For the "three togethers", technical upgrading, and pollutant discharge fee capital, which are part of the four main types of capital, there are problems with revised standards. There is a seven percent stipulation for technical upgrading, so there is no problem in relation to negotiations with other departments or reporting and approval. Everything is acceptable if standards are formulated no lower than seven percent. Readjustments have already been made in pollutant discharge fee standards and they may be assigned soon. This leaves only the question of revising "three togethers" standards for industrial capital construction. Leading comrades of the State Council stated at a meeting of the Standing Committee of the State Council on 25 May 90 that the standards were too low and that stricter requirements should be proposed. However, it would take a long time for the state to formulate unified standards and we cannot wait. A more realistic method is for local areas to formulate local standards. Formulation of local standards that are stricter than national standards is a legal stipulation of the state and we should be bold and good at taking advantage of this right.

When formulating local standards, attention should be given to key industries and major sources of pollution. Examples of key industries include iron and steel, non-ferrous metals, chemicals, electric power, construction materials, petrochemical, and, among light industry, papermaking, fermentation, leather, electroplating, and so on. Controlling key pollution sources means focusing on major polluters. Surveys indicate that among China's thousands of industrial and mining enterprises, pollutant discharges from 3,000 enterprises account for 65 percent of total discharges in China, pollutant discharges from 6,000 enterprises account for 75 percent of total discharges in China, and pollutant discharges from 9,000 enterprises account for 85 percent of total discharges in China. Thus, these 3,000, 6,000, and 9,000 enterprises are the focus in standards formulation the focus of supervision and management. It should be stated that these important enterprises have relatively strong technical strengths and economic strengths, so placing higher demands on them is both appropriate and attainable. This is the key to whether or not investments can be increased and planning objectives attained during the Eighth Five-Year Plan. Focusing on key areas and focusing on major polluters should be a major work principle and work method during the Eighth Five-Year Plan.

C. Reform the environmental protection investment system

The main defect in the existing environmental protection investment system is excessive decentralization of investment decision making rights and a separation of investment departments and regional separation which directly restrict unified planning and optimized utilization of investments. If we do not reform the existing system, it will be hard to improve the results of environmental protection investments.

At the present time, we should study the issue of establishing an environmental protection fund system. The main advantage of a fund system is that there are specific guarantees for capital and guarantees for special loans for special purposes which help in unified planning and centralized administration and aid supervision and inspection. The system for an environmental protection fund can be governmental or civilian. The advantage of the latter is that it can mobilize social forces and foster the initiative of popular organization. The main task we face is centralizing capital from all existing sources according to specific proportions and fighting for a portion of financial allocations, foreign grants, and soft loans. Establish funds at various levels on this foundation such as the state, provincial, and prefectural levels. Fund utilization should conform to government environmental protection programs and plans at all levels, and the form of fund utilization can be divided into subsidies, interest deductions, preferential loans, and so on. Fund administration can implement an arrangement of administration by environmental protection departments and supervision by financial administrations and banks, and management committees or boards of directors can also be established.

Establishing environmental protection investment companies is another arrangement. However, because environmental protection investments basically do not earn profits and capital is tied up for long periods, such companies often have a severe dependence on government allocations and are subject to strict restrictions by government plans, so actually there are not substantially different from the fund system mentioned above.

D. Reinforce supervision and management of environmental protection investment utilization

For a long time, because we have "concentrated on collection and neglected utilization", supervision and management of investment utilization has been relaxed, which is a major cause of the poor results of environmental protection investments at the present time.

In the future, we should focus on two items of work. One is reinforcing supervision and management of environmental protection capital construction projects and technical upgrading and gradually formulating a complete set of supervision and management methods and examination acceptance testing index systems to ensure the

technical reliability of environmental protection facilities and that the quality of projects conforms to requirements. The second is to establish and perfect the supervision and management system for the operation of environmental protection facilities to ensure normal operation of these facilities.

VI. A Basic Assessment of China's Environmental Protection Investments

After considering the history and current situation of China's environmental protection investments, I have formed four preliminary overall assessment opinions which everyone can consider as to whether or not they are correct.

1. In terms of balanced levels of economic development, China has made considerable efforts in the area of capital inputs for environmental protection.

Comparing economic development and environmental protection investments shows that in a situation of very low national income levels and relatively weak economic support capabilities, China has increased environmental protection investments rather quickly to attain a proportion in which environmental protection investments account for about 0.7 percent of our GNP, and we have made significant achievements in the area of controlling industrial and urban pollution. Compared to developed nations at an equivalent stage and developing nations now at a rather high level of development, our environmental protection investment proportion also ranks among the leaders.

2. Based on objective requirements for environmental protection and the demands of the times, China's environmental protection investments are inadequate and the investment proportion should be increased.

Similarly, comparison of income levels and the extent of environmental pollution show that China has created rather severe pollution at a relatively low income stage. The fundamental cause is rapid industrialization and a supernormal industrial structure (compared to developing nations at equivalent income levels) which has formed a huge "polluting industry group" and moved China into the "pollution era" too soon, which requires early prevention. At the same time, public knowledge of environmental protection is greater today than before and the people want government to adopt more effective prevention measures and demand a cleaner environment.

At a time when domestic pressures are great, international pressures are also great. Consumption over a long period in all nations of the world and in particular the developed nations has reduced the amount of public environmental resources available for our use and the cries and pressure in international society for protecting the environment in all countries have gradually strengthened while environmental restrictions in international technical and economic cooperation and trade contacts have also gradually increased, which has added new

pressure on China for environmental protection. Reducing this pressure requires stronger prevention of environmental pollution and this requires increased investments.

3. Our principle of using reinforced management, establishment and perfection of laws, regulations, standards, and policies for guidance, and implementation of environmental protection investments is correct.

Long-term practice in environmental protection in China has proven that using stronger management measures, multiple channels, and many forms are essential for effectively raising the investments required for environmental protection. Moreover, the method of using management to guide and implement environmental protection investments is also easily coordinated with the "polluter responsibility principle" accepted in international society to more clearly determine the responsibilities and duties of all areas of society toward protecting the environment and correcting the tendency toward "emphasizing control and neglecting prevention" that might appear in controlling pollution in state-subsidized enterprises, which helps solve environmental problems during the process of economic development and technical progress.

4. Improving the results of environmental protection investments is an urgent task.

The process of establishing and perfecting an environmental protection investment system relies on progress in reform of the state investment system and cannot proceed on its own. Moreover, technical progress is a prerequisite for improving the results of environmental protection investments, which are based on continual improvements in the quality of environmental protection technical levels and environmental protection equipment. This requires active research and development and conscientious selection of appropriate environmental protection technology that is suited to China's economic development levels and actual planning requirements. The measures to prevent environmental pollution adopted in all new, expansion, and construction industrial projects and urban civilian projects must be conscientiously debated and permitted by environmental protection administrative departments and the examination and acceptance of environmental measures cannot be done merely by seeing if there are measures or not, but must be done by seeing if they meet the requirements of standards. To effectively promote the adoption of new technology, we face the urgent situation of needing to promote the establishment and development of environmental protection industrial markets. Moreover, there must be frequent, conscientious, and meticulous supervision and inspection to guarantee the utilization results of environmental protection investments. We also must formulate several new measures in this area.

REGIONAL AFFAIRS

Malaysia, Papua New Guinea Agree on United Stand at 1992 Brazil Conference

BK2107090091 Kuala Lumpur BERNAMA in English 0453 GMT 21 Jul 91

[Text] Kuala Lumpur, July 21 (OANA-BERNAMA)—Malaysia and Papua New Guinea (PNG) have agreed to take a united stand at the United Nations' conference on environment and development in Brazil next year.

The agreement, in a bid to counter attacks on environmental issues by the developed countries against developing countries, was reached at bilateral talks here Sunday between Malaysian Foreign Minister Abdullah Ahmad Badawi and his PNG counterpart, Michael Somare.

Somare had attended the two-day Association of Southeast Asian Nations (ASEAN) ministerial meeting (AMM) which ended here Saturday. PNG has observer status at the AMM.

Speaking to reporters after their meeting Sunday, Abdullah said Malaysia and PNG had agreed to work out an understanding on environmental issues, especially logging, at the world conference.

PNG, like Malaysia, was also a major timber exporter, he said.

Abdullah said Somare also pledged PNG's support for the proposed East Asia Economic Group and had asked Malaysia to keep it informed of its progress.

He also said that PNG had requested for more Malaysian teachers, especially to teach science subjects, and had wanted more Malaysian banks to operate there.

Abdullah said PNG was also seeking Malaysia's support for its bid for the next presidency of the United Nations.

He said Somare would hand a letter to Prime Minister Dr. Mahathir on the matter on Tuesday.

Micronesia Applies for UN Membership; Issues Plea on Global Warming

BK2807061691 Hong Kong AFP in English 0609 GMT 28 Jul 91

[Text] Palikir, July 28 (AFP)—The tiny Federated States of Micronesia (FSM) wants to be recognised by the world as a sovereign, independent nation, President Bailey Olter said here Sunday. He also called for developed nations to stop carbon gas emissions that could contribute to global warming which could result in FSM being flooded by rising sea levels.

FSM formally applied Saturday to the United Nations secretary-general in New York for membership of the world body. However, Britain is resisting the FSM application, claiming the former trust territory is not a sovereign, independent nation.

FSM signed a "compact of free association" with the United States, the former administrator of the territory, which came into effect in 1986.

Speaking at a press conference to mark his country's hosting of the annual South Pacific Forum, he said his government had lobbied extensively for membership.

"We are asking that those countries who are members of the U.N. will allow us the same chance of becoming a full member and we are asking humbly that all countries will support our effort," he said.

"Maybe because we are small in the eyes of certain countries it means they do not see us as important as other countries, but once you are a country, you are a country."

As to Britain's view of FSM's status, Mr. Olter said whatever the feelings of other countries, the compact was an international agreement between two, independent countries.

"We are independent, and are qualified to apply for full membership of the United Nations," he said. He said he believed FSM's application for membership would be supported by the forum meeting here.

On global warming President Olter said FSM was concerned because their islands were small, flat atolls.

"Since we don't contribute much to the greenhouse effect or global warming we will be asking that the industrialized countries take it easier and think about us," President Olter said.

Environmental Issues To Dominate South Pacific Forum Meeting

BK2907064591 Melbourne Radio Australia in English 0500 GMT 29 Jul 91

[Text] President Baily Olter of the Federated States of Micronesia says economic cooperation and development are the main priorities of the South Pacific Forum.

Officially opening the Forum's heads of government annual meeting in Palikir, Mr. Olter pointed to the Forum's success in combatting drift netting, adopting the South Pacific Nuclear Free Zone Treaty, and encouraging recent constructive developments in New Caledonia.

He said the Forum had united an enormous diversity of cultural, historical, and ethnic backgrounds, and that had begun the preeminent meeting in the region. It also offered Pacific Nations lacking size and influence an opportunity to face up to the world more confidently.

Environmental issues are high on the agenda amid concern that rising sea levels caused by greenhouse gas emissions in industrial nations threaten the existence of some Forum member states. It's been reported that Kiribati, Tuvalu, and the Republic of Marshall Islands could disappear unless production of the gases is reduced. Other environmental issues to be raised at the meeting includes French nuclear testing at Mururoa Atoll and the disposal of chemical weapons from Western Europe on America's Johnston Atoll.

AUSTRALIA

West Coast Oil Spill Investigated

BK2307095191 Hong Kong AFP in English 0920 GMT 23 Jul 91

[By John Yarwood]

[Text] Perth, Australia, July 23 (AFP)—The captain and some crew members of the stricken Greek tanker, Kirki, have been asked to stay in Australia until a government inquiry is held into the disastrous weekend oil spill off the west coast.

Meanwhile, angry fishermen are threatening legal action against the tanker owners if evidence emerges of damage to crayfish stocks in the Indian Ocean fishing grounds where the tanker spewed an estimated 15,000 tonnes of crude.

In another move, Western Australia state Premier Carmen Lawrence said charges might be laid in the wake of what is regarded as Australia's worst oil spill.

The crippled 97,000-ton tanker, carrying a 20 million Australian dollar (15.4 million U.S.) cargo of Gulf crude to a refinery at Kwinana, south of Perth, broke up and caught fire Sunday. All crewmen were rescued by helicopter soon afterward.

Hopes were high Tuesday that the slick formed by the spillage would not be the environmental catastrophe first feared. The disabled tanker was being towed out to sea Tuesday, still leaking small amounts of oil from the 60,000 tonnes remaining in its tanks. But emergency workers said the slick was continuing to break up in favourable weather conditions and had not yet significantly polluted beaches or affected marine life.

It had been reduced to a length of about eight kilometres (five miles) and a width of about 600 metres (yards) and appeared static 12 km (eight miles) off the mainland, Western Australian Department of Marine and Harbours Spokesman Mike Brown said. Small amounts of oil had been washed up on islands, but damage was minimal, he said.

The chairman of the State Oil Pollution Combat Committee, Richard Purkiss, confirmed that Kirki's master, Eleftherios Efstatopoulos, and some crew members had been asked to stay in Fremantle, the state's major port, until an inquiry by the Australian Government's Transport Department had been completed.

They would be questioned and department officials would report on whether further action should be taken, he said.

Mr. Purkiss said many questions needed to be answered about how the vessel's bow broke away.

Ms. Lawrence said the inquiry could lead to charges and called for urgent international action on the threat caused by unworthy ships carrying dangerous cargoes.

She also urged the Australian Government to take the lead in exploring the possibility of an international convention to cover maritime movements.

Current international maritime standards governing ships and shipping movements are not stringent enough and should be re-examined, she said.

Mr. Purkiss suggested the tanker's captain may have known the ship was in trouble for hours before he called for help.

"There is some evidence that supports the fact that he certainly had a problem," Mr. Purkiss said. "He did not report that problem and did not send a mayday (call) until almost the last minute. We are very concerned that he ended up very close to the Australian coast."

He said that hours before the Kirki sent out its mayday, the captain radioed that he would be arriving at Kwinana nine hours later than previously estimated. Although he was only 12 hours away from Perth at the time, he did not explain this comparatively long delay or say his ship was in trouble.

The Australian Institute of Marine and Power Engineers has said that the breaking of the tanker's bow suggested structural weakness. The institute's secretary Phil Olsen said bow weakness could be caused by a number of factors, including poorly repaired previous collision damage, conversion work or poor maintenance and corrosion.

Fishermen in the port of Geraldton, north of the spillage area, said they might join their counterparts in the small fishing town of Jurien, close to the slick, in legal action against the operator of the tanker if the slick affected crayfish stocks along the mid-west coast.

They say this is the time of the year when millions of crayfish larvae sink to the inshore reef floor for about four years until they grow to a harvestable size.

Leith Pritchard, the operations manager at Geraldton fishermen's co-operative, said there was no evidence of damage yet, but it was too early to be sure.

Government's Failure To Take Position on Tropical Timber Trade Scored

BK0108054691 Melbourne Radio Australia in English 0500 GMT 1 Aug 91

[Text] Australia's federal opposition says the government should be condemned for failing to take a decision on Australia's role in the tropical timber trade. The opposition's environment spokesman, Fred Chaney, says that 15 months ago, the government was sent a consultant report it commissioned to study Australia's role in the industry. But he says continuing procrastination by the government is a disgrace especially when attempts are being made to improve relations with Malaysia.

Mr. Chaney says the opposition rejects import bans as counterproductive to reducing forest loss and also as being harmful to Australia's international relations. But,

he says forest management must be changed in some regions to achieve fully sustainable operations.

JAPAN

Former Finance Minister Calls for Expanded Conservation Program

OW2807110391 Tokyo KYODO in English 0952 GMT
28 Jul 91

[Text] Kushiro, Hokkaido, July 28 KYODO—Former Finance Minister Kiichi Miyazawa on Sunday called for a doubling of funds to preserve the environment and for an expanded government program for conservation.

Speaking at a natural preserve in Kushiro for the Japanese crane, Miyazawa, a contender for the next Japanese prime minister, told reporters the budget for the environment agency and related ministry bureaus should be doubled by the 21st century to 3 trillion yen.

He said aid earmarked for environmental protection within the government's official development assistance (ODA) program for developing countries should also be doubled over the next five years to 300 billion yen.

Miyazawa said Japan should do its best to help make next June's "environment summit" in Brazil a success by helping to formulate controls for carbon dioxide emissions, the leading cause of global warming.

"In the post-cold war world, people have become more aware of environmental issues," Miyazawa said.

He further stressed the need for nuclear energy, saying that without it, "economic growth may not be possible."

"While considering safety, we must think of 'clean energy' sources like nuclear energy," he said.

Miyazawa was touring the marshes in Kushiro, where in 1993 the fifth meeting of the Ramsar Convention signatories will be held.

The convention aims at preservation of wetlands which serve as the preserves of waterfowl.

Miyazawa's appearance in Kushiro also doubled as a campaign visit prior to this fall's Liberal Democratic Party poll for party president.

National Transport Policy for Environmental Protection Viewed

OW3107033291 Tokyo KYODO in English 0232 GMT
31 Jul 91

[Text] Tokyo, July 31 (KYODO)—The Transport Ministry said Wednesday it plans to work out a long-range national transport policy for environmental protection, featuring the development of electric cars and a shift from highways to railways.

Officials said the ministry will draw up the "Eco-Transport Program" for the 21st century in two years, starting April 1992.

The program will include studies on ways of reducing carbon dioxide and nitrogen dioxide emissions from the

transport system, which are blamed for much of air pollution and global warming.

As part of efforts to reduce air pollution, the ministry will promote a shift from automobiles to trains and ships, development of electric cars, and stepped-up research-and-development on fuel-efficient auto engines.

The officials said studies will also be made on whether deterioration in Japanese transport services could result from the program and if it would be possible to obtain enough manpower for increased marine transportation.

Under the program, the ministry will conduct tests on reducing air pollution in fiscal 1993 at a selected housing complex in a medium-sized city with a population of 100,000 to 200,000.

Residents at the complex will be asked to test electric cars for shopping and try a "park-and-ride" system, in which commuters drive to the nearest train station and catch trains.

SOUTH KOREA

Heads of Polluting Companies Arrested

SK0208041591 Seoul THE KOREA TIMES in English
2 Aug 91 p 3

[Text] Suwon, Kyonggi-to—Three presidents of industrial companies were placed under arrest yesterday for leaking hazardous substances into stream waters and the sewage channels.

According to prosecutors, the three companies, all located in Kyonggi-to, have habitually discharged industrial waste containing zinc and lead which contain high levels of acidity through hidden pipelines.

Presidents of six other firms in the area were also booked without physical detention for violating regulations on environmental preservation while 96 others were given warnings.

Operations have been halted at the 105 companies which were found to be illegally discharging harmful elements into sources of drinking water until such a time when the waste treatment facilities are judged to be functioning properly, the prosecutors explained.

In most cases, they said, the industrial companies simply put up facilities for the treatment of waste materials for show and leaked hazardous chemicals into rivers through secret channels.

The prosecutors added that some of the firms concluded that the operation of the waste treatment facilities would be too costly and chose [as published] to take the easy way out.

For waste treatment, none of the companies employed any technical personnel who are experienced in environmental fields and placed workers with no such knowledge in charge.

"It is shocking that even after the outbreak of the phenol incident earlier this year, these companies are still ignorant of the enormous impact of their irresponsible actions," the prosecutors said.

Noting that water inspections are being strengthened all over the country, they warned industrial firms to be more wary of the consequences of their actions for the benefit of the general public.

PHILIPPINES

Government To Set Up Reforestation Fund

*HK2407060891 Manila BUSINESS WORLD
in English 24 Jul 91 p 2*

[By Hernani P. de Leon]

[Text] The Asian Development Bank (ADB) asked the Philippine Government to set aside a special account in the National Treasury to provide funds exclusively for reforestation activities.

In the memorandum of understanding (MOU) between the ADB and the Department of Environment and Natural Resources (DENR) for the \$400 million second forestry sector loan, it was specified that a Reforestation Fund be created through legislation not later than 1993.

The memorandum was signed by ADB and DENR officials last July 10. Funds from the second forestry loan are expected to be available starting next year. The loan will finance DENR's National Forestation Program (NFP) over a period of five years.

The proposed fund, according to the memorandum, will be financed from reforestation deposits paid for by commercial loggers, proceeds from debt-for-nature swaps, appropriations as may be made available from the national treasury and other grants and contributions.

Currently no such facility is available to DENR, thus the perennial dependence on assistance from donor institutions. Prior to 1988, the Government was only able to reforest yearly an average of 30,000 hectares in comparison to about 120,000 hectares annual denudation rate.

Reforestation Rate

Since 1988, DENR claims that due to ADB's reforestation loan amounting to \$240 million, the average reforestation annual rate went up to about 150,000 hectares as against annual denudation rate of about 80,000 hectares.

This year, however, DENR has been confronted by lack of local resources as well as depletion of ADB funds for NFP. "We're afraid our targets will have to drop to less than 30,000 hectares this year," a DENR official told Business World over the weekend.

But NFP director Ebert Bautista claimed the year-end figures could be higher. He confirmed the tight financial situation his program is currently in, but expressed confidence it could still perform well despite the scarcity of project funds.

"The private sector has now taken the lead in tree nursery operations when in the past it was DENR's show all the way," he said. Such private sector enthusiasm, Mr. Bautista said, could be the start of widespread non-governmental investment participation in reforestation projects.

THAILAND

Growing Pollution Problem in Gulf of Thailand Cited

*91WN0476C Bangkok THAI RAT in Thai
12 Apr 91 p 3*

[Excerpt] [Passage omitted] In the upper part of the Gulf of Thailand, unless steps are taken to reduce pollution from oil deposits, problems will arise for both people and animals in provinces all along Thailand's coast. The situation could become even worse than that in the Persian Gulf. The reason for this situation is that Thailand has not implemented resolute regulations and laws on this. And among government officials, no one seems to know whose duty this is.

The saddest thing of all is that in the Gulf of Thailand, the boats and ships that anchor off Ko Sichang, that enter and leave Siracha Bay near the refineries, that dock at the deep water ports and at Sattahip, and that enter the Chao Phraya River on their way to Khlong Toei all want to clean their oil tanks and dump their waste water. The crew does whatever it wants without anyone complaining. The captains feel somewhat ashamed and don't want anyone to see what they are doing and so they dump their dirty oil in the sea about five miles off the coast.

Thus, oil deposits have been building up in the Gulf of Thailand for several years. This oil can't go anywhere and has drifted toward the coast. These oil deposits have combined with the oil deposits from the Chao Phraya River. Because of this, Thailand is suffering the harmful effects of oil pollution. Thai and foreign ships and Thai-Japanese docks dump waste water into the Chao Phraya River every day. Again, they do that every day, but no one does anything about it.

Other countries are very strict about the dumping of waste water and oil into the ocean and into gulf and port areas. Newly-built ships are equipped with large tanks that are used to store the waste water and oil. They then dump their waste far out at sea in international waters. If a ship violates the laws, regardless of what flag it is flying, the owner and crew of that ship face serious charges. [passage omitted]

Industrial Pollution of Lake Songkhla Detailed

*91WN0476A Bangkok BAN MUANG in Thai 28 Apr 91
pp 1, 20*

[Excerpt] [Passage omitted] A report from the Office of the National Environmental Board in Songkhla Province stated that the 2,000 factories in Phatthalung and Songkhla provinces are releasing both treated and untreated waste water into Lake Songkhla both directly

and indirectly. In particular, the large factories that are releasing waste water into the lake can be divided into two groups: those that release waste water into the lake directly and those that release waste water into the canals. There are three large plants that produce seafood that release approximately 320-380 kg of BOD waste water a day. There are three other factories that release waste water into the Sam Rong Canal, which then flows to the lake. They release about 640-730 kg of waste water a day.

There is also a factory that releases water into the lake through the Pawong Canal. This is a large factory that releases 2,200-2,600 kg of untreated waste water a day into the canal. Altogether, the amount of BOD released into the lake both directly and indirectly within Muang District in Songkhla Province is approximately 3,200-3,700 kg a day.

The report stated that the industrial plants in Hat Yai District play an important role in releasing waste water into Lake Songkhla. This waste water is released into four canals, the Utaphao, Toei, Nam Noi, and Pawong canals. These plants are involved in latex production and other industries. This does not include several plants that opened just recently. Altogether, they release about 1,000-1,500 kg of BOD a day. Besides this, there is a refrigeration plant, a fish cake plant, a fish meal plant, and various marine products processing plants that release approximately 20,000 kg of BOD a day into these four canals.

The report said that the release of waste water into the lake as mentioned above is just a fraction of the amount of waste water released, because this does not include the amounts released by the 10 newly constructed plants or the plants located in Phatthalung Province. The amount of waste water released into Lake Songkhla is actually several times greater. And if the amounts released by the various communities are added in, it can be seen that the present environment at Lake Songkhla is deteriorating. Even though the newly-built plants use water treatment systems, quality is low and these cannot satisfy the needs. Some of the systems are unusable, but the plants are safe from inspection, because they wait until the rainy season to release the waste water into the lake.

Mr. Somphon Rakthang, a villager who raises bass in Ko Yo Subdistrict, Songkhla Province, said that the environment has deteriorated greatly. The situation at the lake is very alarming. Tens of thousands of fish raised by villagers around Ko Yo die each year. The terrible pollution in Lake Songkhla stems from the fact that the factories release waste water into the lake. And each December and January, the plants secretly release waste water into the lake, because this is the flood period.

Mr. Somphon said that from what he has observed, the factories release waste water constantly. The provincial industrial officials who are directly responsible aren't serious about solving this problem. Actually, the waste water treatment equipment used by the plants is not at

all effective. The plants doesn't have enough waste water reservoirs to store all the waste water and so they secretly release water. [passage omitted]

Efforts To Promote Unleaded Gas Continue

91WN0476B Bangkok SIAM RAT in Thai
30 Apr 91 p 6

[Excerpt] [Passage omitted] Mr. Michai Wirawaithaya, the minister attached to the Office of the Prime Minister, talked with reporters at the Government House about the issue of unleaded gasoline. He has asked representatives from the major oil companies in Thailand to come out in support of this. The oil companies support the idea of selling unleaded gasoline. On 1 May, the Petroleum Authority of Thailand (PAT) will begin distributing unleaded gasoline to more than 40 stations throughout Bangkok. The Shell Company will distribute unleaded gasoline to 63 stations in Bangkok on 1, 3, and 6 May. The Esso Standard Company of Thailand will begin distributing unleaded gasoline on 15 May, and the Caltec Oil Company (Thailand) will begin distributing this beginning 1 August. Mobil Oil of Thailand, which just last March received permission to sell gasoline based on Article 6 of the Fuel Act, has agreed to bring in unleaded gasoline. It has promised to begin importing unleaded gasoline in the near future.

Mr. Piyasawat Amranan, the director of the Office of the National Energy Policy Board, said that the government is taking resolute action to reduce pollution. As for reducing the amount of lead in the atmosphere, the time when people will be required to use gasoline with reduced amounts of lead has been moved forward. The amount of lead in gasoline will be reduced from 0.40 grams per liter to a maximum of 0.15 grams per liter effective 1 January 1992. And efforts are being made to start using unleaded fuel by 1 May. Effective 1 September 1993, all new vehicles will have to be installed with a catalytic converter in order to reduce pollution.

Mr. Piyasawat said that with respect to unleaded gasoline, the government has provided good help. That is, it has reduced the excise tax on gasoline by approximately 1 baht per liter and reduced the retail sales price for special benzene by 30 satang [1 satang equals 0.01 baht] per liter. We will have to wait and see how much attention the people give to this. If the people don't show any interest in using unleaded gasoline, the government may lower the retail price even more in order to encourage the people to start using unleaded gasoline.

A news source in gasoline sales circles said that gasoline sellers want the government to help reduce pollution from the use of gasoline. They want the government to take additional steps besides promoting the use of unleaded gasoline. Such steps include using MTBE [Methyl Tertiary Butyl Ether] to increase the octane rating of gasoline in place of lead. MTBE is quite expensive, and the import duty on this additive is 15 percent. Added to this, they also have to pay an excise tax on gasoline. The Esso Company filed a complaint

about this at the end of last month. The PAT has played a leading role in promoting the use of MTBE in place of lead and succeeded in raising the octane value of PTTI special benzene to 97, which is two points above the level stipulated by the Ministry of Commerce. But since 1988, these two companies have had to bear the cost of this. If the government really wants to help, it should provide help on this front. But to date, the government has stood by idly and not showed any interest in this.

A news source from the Subcommittee To Consider the Quality of Fuel Oil, which is chaired by the director-general of the Department of Commercial Registration, said that the subcommittee will soon submit a proposal to the Petroleum Policy Subcommittee on waiving the import duty on MTBE. As for other items such as "reforrate," which is an oil component used by oil refineries to increase the octane rating, normally, the duty fee is paid back.

REGIONAL AFFAIRS

Czechoslovak-Hungarian Talks Leave Danube Gabcikovo Dam Project Unresolved

AU1707143991 Prague CTK in English 1928 GMT
15 Jul 91

[Text] Bratislava July 15 (CTK)—The latest round of the Czechoslovak-Hungarian talks on the construction of the controversial Gabcikovo-Nagymaros hydroelectric project ended here today with a Czechoslovak proposal to create an international commission to study the problem further.

The commission will be made up of Czechoslovak, Hungarian and European Community (EC) experts who will consider all proposed variants of the project and their potential impact on the environment.

Slovak Premier Jan Carnogursky told journalists the Czechoslovak side insists on completion of the Gabcikovo part of the dam project. In view of the growing financial losses caused by Hungary's unilateral suspension of work on the Nagymaros part, Czechoslovakia cannot accept Hungary's proposal that work stop on the Gabcikovo dam, he said.

The Hungarian delegation also pushed for the annulment of the original 1977 treaty on the project, the establishment of a bilateral commission of experts, and a halt to construction during its work.

Hungarian Commissioner Ferencz Madl, head of the Hungarian delegation, said both experts and the public in Hungary are very worried about the environmental risks connected with the project. Once the 1977 treaty is annulled, the two states should cooperate in flood prevention and river transport on the Danube, he said.

Carnogursky said the Slovak Government will deal with the Gabcikovo issue at its session on July 23 and a decision is expected to be taken then. It is unlikely that the results of today's discussions might change the stand of the Slovak Government, he said, adding that the Federal and Slovak Government representatives were united at the talks.

Ministers Explain Slovak Government Decision on Gabcikovo Project

AU2807135391 Bratislava PRAVDA in Slovak 24 Jul 91
pp 1,2

[“Lubo Rabay, CTK”-report: “Gabcikovo Temporarily”]

[Excerpt] [Passage omitted] The [Slovak] government's decision on what is to be implemented in the interest of completing the construction of the Gabcikovo hydroelectric power project is a long way off the “C” variant, against which ecologists and environmentalists have been voicing such strong objections, Viliam Oberhauser, minister of forestry and water economy of the Slovak Republic, and Ivan Tirpak, minister-chairman of the Slovak Commission for the Environment, told journalists at a news conference after the government session.

All newly built facilities will have to pass through the sieve of the 19 conditions set by the Slovak Commission for the Environment, according to Article 14 of the Water Law. Many of them will thus undergo significant correction from the ecological viewpoint. Viliam Oberhauser then said that the project's completion—its startup is planned for fall 1992—will permit the self-financing of environmental protection measures in the Danube lowlands. The temporary solution approved by the government on the basis of a state expert evaluation also conforms with the conditions for the project's utilization under international law. The adjustments that will be carried out do not go beyond the framework of the [Czechoslovak-Hungarian] interstate agreement of 1977 [on the joint construction and operation of the Gabcikovo-Nagymaros Danube dam project]. In their other replies, too, the ministers confirmed that, rather than economic or ecological reasons, the Czechoslovak side makes the alternative solution conditional on legal considerations because this is the only solution that will make it possible to legally complete the project and operate it independently of the Hungarian side's position. The cost of completing the project will be 8.4 billion korunas. The decision on whether the temporary solution will also be the final solution will be made in fall, after the completion of research into the possible impact of this variant on underground water in the Rye Island [area along the Danube in southern Slovakia]. [passage omitted]

[Bratislava NARODNA OBRODA in Slovak on 24 July on pages 1 and 2 carries a 1,200-word “A. Melicharkova, CTK”—report on the Slovak government session and the subsequent news conference. According to the report, “it arose from the information” supplied by ministers Oberhauser and Tirpak that “the CSFR is losing more than 6 billion korunas annually” because the Gabcikovo plant lies idle. They also announced that another round of talks with the Hungarian side is planned for September and that the “final decision on the method of completing the project” will not be made “before October or November.”]

Czechoslovak Minister Calls for Compromise With Hungary Over Gabcikovo

AU0208093391 Prague LIDOVE NOVINY in Czech
30 Jul 91 pp 1, 2

[Interview with Minister Josef Vavrousek, chairman of the Federal Committee for the Environment, by Cestmir Klos; place and date not given: “Not To Let Go in the Middle”]

[Text] Our nations have had bitter experience with things that are “temporary.” [allusion to the claim by the Warsaw Pact armies which invaded Czechoslovakia in 1968 that their stay would be “temporary”] One such “temporary” solution is now being planned on the Danube—the temporary variant of the Gabcikovo hydroelectric power plant. The first surprise was the backing which it received from the Slovak Government. The second surprise was that it was accepted also by the Federal Government as a second—sure—variant, in case

of failure of the unsure variant, which would have to be implemented together with the Hungarians. And the third surprise? That this was announced on the radio, without a single word of critical comment, by Josef Vavrousek, chairman of the Federal Committee for the Environment. By the same Engineer Josef Vavrousek who wrote the study issued by the Ecological Section in the late eighties, in which all opponents of the destruction of the beautiful landscape downstream from Bratislava had been looking for arguments.

[Klos] Have you changed your opinion so drastically?

[Vavrousek] No! Of course, I have learned many new details since then but I stand by what I wrote in the NIKA magazine (1989, issues 1 and 2). I wrote there literally: "The insensitive and undemocratic approach in seeking a comprehensively acceptable solution and the manifested intransigence might even cause long-term aggravation of our relations with Hungary." That is exactly what has now happened!

[Klos] What do you propose then?

[Vavrousek] The same thing that I proposed at the government session—negotiations. If we just stick to our positions, we will not get anywhere. Two razor-sharp positions are constantly clashing and the only result is that passions are running ever higher. I feel as if I am stuck between two grinding stones. When I assume an equally stubborn position against the "C" variant [which provides for diverting the flow of the Danube to Czechoslovak territory and is therefore regarded by Hungary as a violation of the Paris Treaty on the common border], I deprive myself of the opportunity to intervene and to play the role of mediator. Of course, it would be far more comfortable to pound my fist on the table and then to sit with my arms folded and wait for my prediction to come true. Even though in the government the pessimistic view prevails that the Hungarian position insisting on halting all work is unchangeable, I want to try for another round of talks.

[Klos] But what can you offer to the Hungarian deputies with whom you have requested a discussion?

[Vavrousek] I will try to explain the situation to them and to convince them about the necessity of seeking a solution. I will not tell them that our variant is the only possible one. As a matter of fact, which of our variants is actually the best one? All of them are bad and it is necessary to weigh their pros and cons and to choose the one which is least bad and most acceptable to both sides. There is no other solution. Of course, it would have been better had nothing been built on Rye Island [area along the Danube in southern Slovakia] but that is now beyond our influence. We are now in the middle of it. I used to climb mountains and I learned one thing from it—you cannot let go when you are in the middle.

[Klos] But some people do have a solution—the "C" variant....

[Vavrousek] That will cost a lot of money and destroy another piece of land. And, once completed, there will be enormous problems operating it. All of a sudden, the

idea will occur to someone to stop the other side's boats, someone else will come up with the idea of stopping the other side's trucks, then someone will sink the other side's vessel.... The path of confrontation leads nowhere. Agreement is the only possibility.

[Brief interviews with Josef Vavrousek on the Gabčíkovo project are published also by Prague MLADA FRONTA DNES in Czech and Prague OBCANSKY DENIK in Czech on 31 July. In the 250-word MLADA FRONTA DNES interview, Vavrousek "deplores" the fact that "no other form of communication" has been found with the ecological movement than "demonstrations and suppression of these demonstrations." Asked about a possible solution to the Czechoslovak-Hungarian dispute about the project, Vavrousek says: "I personally believe that a generally acceptable variant might be the shelving of the Nagymaros section indefinitely or the recommendation to the Hungarian government that it build at Nagymaros a low navigation barrage [nizký plavební stupen] that would allow navigation even at times of a low water level on the Danube. That would make it possible to complete the Gabčíkovo hydroelectric power station, but with a substantially changed philosophy for its completion and operation, so that it could discharge also ecological functions." In the 300-word OBCANSKY DENIK interview, Vavrousek says that on 30 July he sent a letter to the speaker of the Hungarian parliament, in which he requested the opportunity to address members of the Hungarian parliament "at some point in early September." In his address he hopes to convince them about the need for a "constructive" solution that would be "feasible and acceptable to both sides, so that Gabčíkovo does not become a source of tension." He reiterates his concern that the two sides' sticking to their present positions "will not lead anywhere" and might even result in "the use of economic sanctions and mutual willful acts."]

Protesters Demand Suspension of Gabčíkovo Dam Construction

LD3007183991 Prague CTK in English 1638 GMT
30 Jul 91

[Text] Bratislava July 30 (CTK)—Slovak and foreign protesters against the hydroelectric Danube power plant at Gabčíkovo want construction suspended until a decision on its future can be made based on independent analysis, Slovak environmentalists told a press conference here today.

A representative of the civic initiative "Euroretaz" (Eurochain) in Samorin, southwest Slovakia, denied that groups opposed to the project are paid by foreign countries, namely Hungary, but acknowledged close contacts with environmental organisations in Hungary and Austria.

Euroretaz members and other environmentalists from southwest Slovakia yesterday sent a petition to the Slovak Government protesting what they called "illegal" filling of the derivation canal with water, the representative said.

Other Czechoslovak experts and Federal Assembly (parliament) deputies, who were present at the press conference, argued that completion of the Gabcikovo power plant would save forests in the region which are suffering from a drop in water levels.

Controversy surrounding the Gabcikovo-Nagymaros twin dams came to a head in 1989 with Hungary's one-sided withdrawal from the project. Czechoslovakia has decided to complete the Gabcikovo part on its territory.

Bulgaria, Romania Consider Joint Action on Danube Environment Problems

*AU3007171891 Sofia BTA in English 1612 GMT
30 Jul 91*

[Text] Sofia, July 30 (BTA)—“The Bulgarian and Romanian Governments are ready to take joint action and to participate in the working out of a project to solve the environmental problems of the Ruse-Giurgiu region,” it is said in a letter which the two countries sent to Mr. Thomas Garvey, director of the PHARE [Economic Reconstruction Aid for Poland and Hungary] Program. The letter comes in fulfilment of the political conditions set by the European Community for rendering aid to the two states.

Today Mr. Dimitur Vodenicharov, Bulgaria's minister of the environment, and Mr. Valeriu Eugen Pop, minister of waters, forests and environment of Romania, signed the letter and handed it over to EC expert Jerome Woodford who was on a visit to Romania to study the environmental situation in the Ruse-Giurgiu region.

At their meeting today Mr. Vodenicharov and Mr. Pop discussed bilateral cooperation and the possibility for signing a Bulgaria-Romania convention on environmental protection. Mr. Pop was informed about the measures taken by the Bulgarian Government for ensuring the safety of the Kozloduy Nuclear Power Plant.

The two ministers agreed that more active business contacts should be established between Bulgarian and Romanian environmental institutions and that a joint working group should be set up to make all the necessary arrangements for holding a seminar on the problems of the Ruse-Giurgiu region by the end of October. The idea of the seminar was launched by the United National Environment Programme (UNEP).

Romania, Bulgaria Sign Danube Environment Protection Protocol

*AU3107075791 Bucharest ROMPRES in English
0725 GMT 31 Jul 91*

[Text] Bucharest ROMPRES 31/7/1991—Romania's minister of the environment, Valeriu Eugen Pop, who visited Sofia on 29 and 30 July at the invitation of his Bulgarian counterpart Dimitur Vodenicharov, signed a Romanian-Bulgarian protocol for cooperation in the protection of the environment along the Danube. The Bulgarian Government's measures concerning the

nuclear plant at Kozloduy were presented to the Romanian side and a prompt information programme was agreed on the state of the environment on the two banks of the Danube.

During his visit, the Romanian minister was received by the president of the Republic of Bulgaria, Zhelyu Zhelev, and by prime minister Dimitur Popov.

BULGARIA

Government Suspends Lead Production

*AU2507174691 Sofia BTA in English 1441 GMT
25 Jul 91*

[Text] Sofia, July 25 (BTA)—Today the government decided to stop the production of lead in Bulgaria. The two Bulgarian lead plants will be closed down by the end of the year. After reconstruction and modernization the nonferrous metals plant near the city of Plovdiv (southern Bulgaria) will start producing zinc, while the plant in the town of Kurdzhali will switch over to secondary lead production. According to experts, both productions are ecologically clean.

The problem of stopping Bulgaria's lead production was raised about a year ago after reports of severe environmental damage were brought to light. The two socialist cabinets of former Prime Minister Andrey Lukyanov failed to adopt a final decision on the issue. Mr. Ivan Pushkarov, minister of industry, trade and services, said after today's meeting that the sides concerned had managed to work out a compromise despite the conflicting interests of the plants' employees and the inhabitants of the polluted areas. The government is now attempting to solve the three main problems that the stopping of lead production entails. First, what to do with lead concentrate in future? An idea has been put forward and negotiations have started on moving lead production to a third country. A Balkan consortium will probably be set up in Greece with the assistance of the World Bank. However, Mr. Pushkarov said that it is too early for making final decisions.

The second problem concerns the people employed in the productions to be stopped. The number of laid-off workers will be greater than predicted because the lead-processing plants will also be shut down. Part of the employees will be pensioned off, while alternative employment projects will be worked out by mid-August for the redundant workforce. However, it is impossible to settle the problem in all its aspects at the moment.

The especially painful problem of reclaiming contaminated land is also in the focus of attention. Technological and financial assessment of the necessary works is to be made soon. According to information released by the Ministry of Agriculture, there are about 15,000 hectares of contaminated land, the re-cultivation of which will require a considerable amount of money. Bulgaria has established contacts and is holding negotiations with U.S. companies which are ready to donate funds for land reclamation provided that lead production is stopped.

Environmental Commission Chairman Interviewed on Kozloduy Nuclear Plant

AU2407114491 Sofia TRUD in Bulgarian 18 Jul 91 p 3

[Interview with Krasen Stanchev, chairman of the Parliamentary Environmental Commission, by TRUD commentator Nikolay Buzin; place and date not given: "The Situation at the Kozloduy Nuclear Power Plant Is Extremely Alarming"]

[Text] *After returning from Vienna where Krasen Stanchev, chairman of the Parliamentary Environmental Commission, together with Deputy Prime Minister Aleksandur Tomov took part in talks on the fate of the Kozloduy Nuclear Plant, Mr. Stanchev spoke with TRUD commentator Nikolay Buzin.*

[Buzin] Mr. Stanchev, were you surprised by Europe's decision on the fate of the Kozloduy Nuclear Plant?

[Stanchev] Until the middle of last year the EEC had not envisaged providing funds for assisting Eastern European power supplies. After complex lobbying, the PHARE [Economic Reconstruction Aid for Poland and Hungary] program now envisages such aid. The best variant, however, is an alternative to nuclear energy in Bulgaria but the EEC does not envisage such a variant.

[Buzin] If we accept that the fate of our second nuclear plant in Belene was decided to a large extent by pressure from "the Greens," what part did they play in discussions on Kozloduy?

[Stanchev] Their part was, is, and will remain small. In the case of Kozloduy the situation depends on the country's current possibilities. Ecoglasnost carries a certain amount of blame, but most of all, I am responsible as the one who headed the group of experts. We did not pay enough attention to Kozloduy.

[Buzin] Do you think that Europe and the world in the near future will totally reject nuclear energy? What are the alternatives to this type of energy?

[Stanchev] If Kozloduy "blows up," I believe that the development of nuclear energy will be "put on ice" for a relatively long time. There is a question here of one small detail: The situation at Kozloduy is extremely alarming. This is obvious! A long time ago the alarm ought to have been raised, but the secretiveness surrounding our nuclear energy program, also guarded partially by the International Atomic Energy Agency, stopped this from happening.

Europe and the world will not assist Bulgaria with the alternatives to nuclear energy. In the main there are two: gas fired power stations and energy saving measures, but in both cases time is needed.

[Buzin] There are ideas for the Bulgarian energy industry to be owned and managed by foreign companies, consortiums and so on. What is your attitude to this?

[Stanchev] From a purely economic, even political, point of view, the idea of a consortium is impossible. The best solution would be a bidding "mechanism" organized by mixed consultative teams.

Yes, in a similar way our problems in other areas of production can be resolved. At the moment the requirements have not been clarified for importing technologies, nor the requirements for foreign investments in general. The new environmental protection law lays down the regulations for the energy industry's participation in this. It is not difficult to imagine that without these regulations a particular type of "eco-madness" is possible.

Radioactive 'Hot Spot' Reported at Kozloduy Nuclear Plant

AU2407132491 Sofia Khorizont Radio Network in Bulgarian 1300 GMT 24 Jul 91

[Text] We have received an announcement from BTA that two days ago the group in charge of radioactive control discovered radioactive pollution on the site of Nuclear Power Plant No. 1. It is a hot spot [petno] of an area of about 1 square meter with a radioactivity of approximately 2.5 milliroentgens per hour.

The hot spot is situated near the smoke stack of one of the special buildings. Efforts are currently underway to identify the cause of the radiation and measures are expected to be taken to limit the polluted hot spot.

Kozloduy Nuclear Plant No. 6 Generating Unit To Be Started Up

AU2507084391 Sofia BTA in English 0759 GMT 25 Jul 91

[Text] Kozloduy, July 25 (BTA)—"If all remaining tests pass normally and as expected, generating unit six will be plugged into the country's power grid in a week's time," Mr. Ivan Ivanov, director of generating units five and six of the Kozloduy Nuclear Power Plant, said last night.

He said that the Committee on Peaceful Uses of Atomic Energy allowed the start-up of the second 1,000-megawatt reactor. All its operating characteristics will be tested, including a trial turning of the turbine and tests of the generator, as well as many mandatory experiments related to the safety of the generating unit.

The generating unit has been staffed with senior operatives and shift workers. Under the Peaceful Uses of Atomic Energy Act, their qualifications will be checked by a state commission.

Two New Leaks Found at Kozloduy Nuclear Plant

AU2607113491 Paris AFP in English 1101 GMT 26 Jul 91

[Text] Sofia, July 26 (AFP)—Two new leaks have been found at a Bulgarian nuclear plant already contaminated with radioactivity, a senior official said here as plans went ahead to pour cement over the site of the first leak.

Two "small areas" on the facade of one reactor and on the power plant platform had been discovered Wednesday to be contaminated, the president of the State Atomic Energy Company Zakhari Boyadiev said in a television interview late Thursday.

Officials said Friday that cement was to be poured immediately onto the part of the Kozloduy plant found to be radioactive on Monday.

The area of the first leak was emitting 10 times the permitted level of radioactivity, the BTA news agency reported.

Mr. Boyadiev said the radioactivity level of the two new leaks was double that of the first one.

The International Atomic Energy Agency has pressed Bulgaria to modernize or close down four reactors at the Kozloduy plant. Neighbouring Austria wants the plant shut down.

"If the heavy rain of recent days was enough to crack the protective walls at the Kozloduy plant, you can easily imagine what could happen if there was an earthquake," Joachim Horn, an expert from the plant, said in an interview with the Austrian newspaper "AZ" [Vienna AZ in German 26 Jul, reporting the first leak, identifies Horn as Cologne Deutschlandfunk Network's specialist on Kozloduy].

Part of the platform measuring two square metres (20 square feet) between reactors one and two would be covered in cement, Mr. Boyadiev said.

Reactors one and two, the oldest in the power station, are due to be halted between August 15 and September 15.

The government also decided on Thursday to keep the country's second nuclear power station at Belene on the banks of the Danube closed, Vice Prime Minister Aleksandur Tomov said, the agency reported.

The plant, which is equipped with a reactor of 1,000 megawatts, would be converted during the next few years into a conventional station powered by steam and gas and would produce 1,500 megawatts.

Construction work at the plant was halted last year at the request of the Ecoglasnost ecology movement which said that the station had been built on ground at risk from earthquakes.

Recent Radiation Levels Reported 'Normal, Unchanged'

AU2607135591 Sofia BTA in English 1322 GMT
26 Jul 91

[Text] Sofia, July 26 (BTA)—The radiation situation in Bulgaria has remained normal and unchanged for the last 15 days, the Committee on Peaceful Uses of Atomic Energy reports. According to the Civil Defence Headquarters and the Bulgarian Academy of Sciences, which are taking readings, background radiation is within the normal level for this country.

The announcement was released in connection with recent reports of radioactive contamination in the area of the Kozloduy Nuclear Power Plant and with enquiries from certain embassies.

USSR Atomic Power Ministry News Conference on Kozloduy Nuclear Plant Problems

PM0208091191 Moscow KRASNAYA ZVEZDA
in Russian 27 Jul 91 First Edition p 2

[Lieutenant Colonel A. Dolgikh report: "Kozloduy: What Happened"]

[Text] A press conference has been held at the USSR Ministry of Atomic Power and Industry regarding problems linked with Bulgaria's Kozloduy nuclear electric power station [AES].

Here are the details. The station was built by Soviet specialists and fitted with our equipment. The first power unit (a VVER-440 [440 kilowatt water-cooled, water-moderated reactor]) was started up in 1974. By the beginning of this year four such units were in operation at the AES, along with a "million-watter" (a VVER-1000). The station had a total yield of 2,760 megawatts. A second "million-watter" is ready for startup. Kozloduy contributes roughly 40 percent of Bulgaria's overall power store.

It must be said that the VVER-440 units are somewhat outdated and are therefore subjected to various checks and reviews more often than the others. Not so long ago the International Atomic Energy Agency [IAEA] conducted a routine check and, whereas the state of our stations and those in Czechoslovakia with this type of reactor satisfied this international organization's specialists, the head of the IAEA literally said the following about Kozloduy: "In that form I would not give my blessing for the station to continue to operate." I would note that it was not a question of the VVER-440 units (their state did not elicit particular complaints) but the way in which the station is run. The commission was struck by the filth, the neglect, and the poorly qualified maintenance personnel. Poor wages, housing problems, and the oppressive psychological atmosphere in which Bulgarian atomic energy workers have found themselves force them to "flee" the AES.

The IAEA's conclusion came as a bolt from the blue for many people, particularly the Bulgarian public. A movement in favor of closing the AES has been mounted in the country. All Europe is worried, moreover. Therefore at a recent IAEA sitting in London some people even demanded that the station be shut down. However, this was by no means the general opinion and in any case the people of Bulgaria and its government will have the last word.

The international community has currently decided to earmark \$13 million for this country (specifically for Kozloduy). At least two tasks must be accomplished: The necessary work must be carried out on the VVER-440 reactors and at all the station's technical installations and the qualifications of the maintenance personnel must be raised to meet the relevant requirements. The second task is more complex. It has therefore now been decided to send foreign specialists to Kozloduy to help out. These are apparently to be representatives of the

USSR, Czechoslovakia, and the FRG, that is those countries with stations with similar reactors.

Last. It was noted at the press conference that it became clear four years ago that an abnormal situation was developing at the Kozloduy AES. The findings from our specialists' annual checks—conducted at the Bulgarian Government's request—attest to this. The leadership was given the information. These checks stopped being carried out as of 1989. Naturally, by decision of the Bulgarian leadership. It is no secret that the recent reappraisal of previous ideological and political views has somewhat changed relations between our countries. But what has ideology or politics to do with it if it is a question of technology—and by no means simple technology at that? Was Chernobyl not enough?! I don't think that it was enough for our specialists to report their alarming findings to the country's leadership alone. If they saw that everything remained unchanged, they should have turned to the selfsame IAEA and spoken out in the mass media... However, as is well known, it's all very well to be wise after the event. But conclusions must still be drawn.

A. Abagyan, general director of the Energiya Science-and-Production Association; S. Tipikin, chief engineer at the Zarubezhatomenergostroy All-Union Production Association; Ye. Ignatenko, chief of the USSR Ministry of Atomic Power and Industry Administration for Information and Public Relations, and other specialists answered journalists' questions.

CZECHOSLOVAKIA

High Cancer Rate in South Bohemia District Attributed to Radioactive Contamination

AU1807112391

[Editorial Report] Prague MLADA FRONTA DNES in Czech on 17 July on page 3 carries a 900-word Marcela Pechackova article entitled: "Is Radon the Cause?" The article examines possible causes of the high incidence of cancer in the Strakonice District in South Bohemia, a district "where uranium used to be mined."

According to Pechackova, an average of 550 people per 100,000 inhabitants in Strakonice district contracted cancer in 1988. Thereby, the district had the highest incidence of cancer of all districts in Czechoslovakia (the rate for East Slovakia, for example, was 300; for North Bohemia, the most heavily polluted region, 386; and for Prague 443). Moreover, the tendency is rising—not only in Strakonice (which had only 450 cases of cancer per 100,000 inhabitants in 1985) but in South Bohemia as a whole.

Pechackova says: "[Czech] Minister of Health Martin Bojar learned about this only recently when the ministry was visited by Bretislav Reznicek, chairman of the Strakonice district office. He came equipped with persuasive arguments—figures about the occurrence of natural radon in the entire Strakonice District." According to these figures, "drinking water resources in the district

are contaminated with radon, the occurrence of which exceeds the norm once to eightfold."

According to experts, "the occurrence of radon really seems to be the strongest cause" of the high incidence of cancer in Strakonice District. It is impossible, however, to completely discount other factors, such as the fact that there are more smokers in the area than elsewhere, the high consumption of smoked meat, the shortage of water treatment plants in the district, or the fact that "the natural gas pipeline does not conform with the norm."

Soviet Military Dumps Pose Pollution Threat to Prague Water Supply

LD2207202491 Prague Federal 1 Television Network in Czech 1730 GMT 22 Jul 91

[Summary] The Karany water plant supplying Prague with 20 percent of its water consumption is in an immediate danger of being polluted by toxic substances left behind by the Soviet troops stationed at the Milovice military area from 1968 until their withdrawal this year. At least 50 percent of 700 of the Karany wells alongside the River Jizera are exposed to the danger of being polluted from some 500 Soviet Army dumping areas dug inside the first and second water protection zones. The majority of these dumps were filled with metal objects.

The water supplies are in danger of being polluted with oil and toxic substances such as beryllium. One kilo of mud from Mlynarice stream contained up to 440 mmg of oil substances. Soviet lubricating oils leaking from their tanks contained polychlorinated biphenyls. The territory around the Milovice military airport suffered from major leaks of aviation kerosene.

There are 92 localities in Czechoslovakia which suffered ecological damage from Soviet troop activities. This damage amounts to almost 3.5 billion crowns and, taking into account the cost of geological works necessary to tackle the situation, the sum amounts to over 5 billion crowns.

New Restrictions on Imported Waste Materials Implemented

AU0208140791 Prague CTK in English 1309 GMT 31 Jul 91

[Text] Prague July 31 (CTK) - Tomorrow marks the first day of new restrictions on imported waste materials, Czech Environment Minister Ivan Dejmal announced today. Dejmal told reporters that on August 1, a federal law prohibiting the import of any waste without the permission of the Environment Ministry comes into effect. From now on, firms will only be allowed to bring in waste if they can also ensure its disposal.

One example cited by Dejmal was sediment from water treatment plants, which can be transformed into compost and used as fertilizer in combination with higher quality material from the West.

He also discussed a report for the Czech Government, prepared jointly by the Czech Environment Ministry and the Prague Mayor's Office, on the critical situation in the

capital. Prague residents make up nearly half (47 per cent) of the inhabitants of the Czech Republic who live in permanently polluted conditions.

Dejmal cited a catalogue of ills including the city's high population density (2,382 people/square kilometer), excessive reliance on low-grade coal for energy, an inconvenient and overloaded communications network, inadequate transport regulations, outdated industry and technology, shabby electrical systems, dilapidated housing and poor sanitary conditions.

While the Vltava River basin is no doubt picturesque, he said, it traps air pollution above the city.

Dejmal said a major, though hidden cause of Prague's polluted environment today was the capital's development as a 'socialist metropolis' in the past, when its ecological limits were ignored by central planners.

HUNGARY

Environmental Damage by Soviet Troops Assessed as 'Greater Than Previously Imagined'

LD2307165891 Budapest Kossuth Radio Network in Hungarian 1000 GMT 23 Jul 91

[Text] Led by premier Jozsef Antall, an on-the-spot inspection is being held today at the Tokol airfield, in order to show the environmental damage caused by the Soviet troops. Attila Csaszar reports:

[Csaszar] Prior to the inspection of the Tokol airfield, government members were informed by Minister Sandor Kalnokis about the results of the environmental damage assessments carried out between 15 November 1990 and 19 May 1991. The press was informed separately by Ern Kis, an expert of the Ministry of Environmental Protection. He said that the damage caused at the former Soviet barracks and practice grounds has been assessed by 1,300 experts over some 120,000 working hours. According to this, in the past 35 years the Soviet troops caused our country greater damage than previously imagined. They have contaminated and destroyed 40 percent of ground and underground waters and 16 percent of the living world and landscape. In the case of the Tokol installation, this has reached such an extent that the 3,000 cubic meters of kerosene are now hardly visible on the ground surface, while the hydrocarbon pollution, according to the opinion of the Ministry of Environmental Protection experts, is remorselessly and rapidly flowing toward the Danube, endangering the functioning wells and long-range water bases of the metropolitan water works. This situation is topped by the 750,000

cubic meters of polluted soil and the 72,500 cubic meters of bulldozed building rubble and dangerous waste. In their opinion, if immediate measures are not taken, it could result in the spread of pollution and a significant increase in the costs of subsequent restoration. The solution now would be for the government to divert 9.6 billion forints of immediate rapid aid for starting the work. Jozsef Antall and his government are also at present evaluating this request as they inspect the Tokol airport.

This year there is no chance for the money requested by the Ministry of Environmental Protection, according to Mihaly Kupa [finance minister], because we have already spent even the savings. Naturally, everything depends on the government decision. Discussions with the Russians [as heard] must be conducted in such a way, he added, that a zero balance should, if possible, result. In answer to a question he said his personal impression is one of despair. However, the environmental damage must at all events be reduced.

Breakdown in Paks Nuclear Power Plant Reported

LD1807174291 Budapest Kossuth Radio Network in Hungarian 1700 GMT 18 Jul 91

[Text] There was a breakdown in the Paks nuclear power station at dawn this morning. The event was classified as first-degree on the international scale of seven. Nobody was hurt and radioactive material did not escape into the environment.

Shortly after 0100, the seal of one of the joining elements of the reactor's pressure indicator system became faulty and the escaping steam damaged a few items of measuring equipment. The reactor protection system came into operation and closed down the block. Repairs are now being carried out, and the reactor will be re-started following completion of the work.

Paks Nuclear Reactor Resumes Operations

LD2407203991 Budapest MTI in English 1613 GMT 24 Jul 91

[Text] Budapest, July 24 (MTI)—The No. 1 reactor of the Paks nuclear power station is back in action and providing the national electricity network with electricity.

A minor malfunction occurred in the No. 1 reactor on July 18, graded as one on the seven-point international scale of nuclear incidents. The error was put right by Tuesday, and the reactor linked back up to the national electricity network.

REGIONAL AFFAIRS

Belize, Mexico Issue Communiqué on Economic, Environmental Cooperation

*FL2207233491 Bridgetown CANA in English
2151 GMT 22 Jul 91*

[Text] Belmopan, Belize, July 22, CANA—A two-day meeting of Belizean and Mexican parliamentarians has ended with a joint communiqué calling for more cooperation in trade, air navigation, health, and the environment.

The fifth interparliamentary meeting was attended by 13 members of the Belize House of Representatives, including nine from the ruling People's United Party and four from the opposition United Democratic Party, and a 14-member Mexican delegation.

The 18-point communiqué, issued late Friday night, said the meeting was carried out in "an atmosphere of cordiality and frankness," and said more bilateral cooperation was needed against a background of the formation of new regional economic blocks. Specifically, the communiqué said it was necessary to make more dynamic the flow of trade between the two nations, with mutual support in customs, financing, and investment.

The delegations proposed that both countries "explore the possibilities of establishing a free trade agreement having regard to existing commitments with other international bodies." They called for a broad agreement on air navigation to allow for increased tourism, and cultural and trade exchanges. The communiqué also asked for the implementation of a joint vaccination programme to prevent the spread of cholera.

Both sides agreed to explore the possibility of fostering a Belize-Mexico-Guatemala border commission to protect the biosphere, with a view to the eventual establishment of a trinational peace park.

The leader of the Mexican delegation Senator Joaquin Gonzalez Castro said it had been a very fruitful meeting. Earlier, Prime Minister George Price welcomed the Mexican delegation. He talked of an important agreement already signed with Mexico on drug trafficking, a commission to protect land and sea boundaries, and harmonisation of customs and immigration.

BRAZIL

Government Seeks To Demarcate Indian Lands

*91WN0589B Sao Paulo FOLHA DE SAO PAULO
in Portuguese 29 Jun 91 pp 1-4*

[Article by Edna Dantas: "Government Seeks To Demarcate Indian Lands To Improve Its Image"]

[Text] Brasilia Bureau—A classified document obtained by FOLHA DE SAO PAULO shows that the government has established—as a criterion for demarcating Indian lands—the public relations effect its action would have

abroad, in the light of Eco-92, which will take place in Rio. The document was distributed yesterday in Planalto Palace.

In the item "Programs for Immediate Action," the document emphasizes that "in connection with implementation of the Program for Immediate Action Concerning Lands, priority has been assigned to areas which by virtue of their international impact should have their boundaries established prior to the International Conference on the Environment and Development, which in the present instance means the Ianomami and Guarani-Kaiowa areas."

The report, prepared by the Ministry of Justice, was presented yesterday by Justice Minister Jarbas Passarinho at the sectorial meeting held to deal with the Indian question. A total of 30 persons participated in the meeting, including President Fernando Collor de Mello, seven cabinet ministers, and the new president of Funai [National Indian Foundation], Sydney Possuelo.

Everyone received a copy of the "Synthesis of an Action Plan for Demarcation and Assistance in the Indian Areas—1991-1993" together with a bound volume containing all legislation that has been passed during the Collor administration in connection with this sector.

At the conclusion of the meeting the government announced that it will immediately resume evacuation of the Ianomami territory in Roraima, where Chief Romeu Tuma, secretary of Federal Police, says there are 5,000 miners.

Collor was the principal target of the most recent international demonstration in favor of demarcation of the Ianomami lands. On his trip to the United States he received a document prepared by the "Environmental Defense Fund" in which that organization advocated demarcation of the area.

According to the synthesis presented at yesterday's meeting, demarcation of the area will be initiated only after approval of the reappraisal of the area made by the Ministry of Justice. This reappraisal is scheduled for completion in 90 days, "on the assumption that funding will be made available promptly."

Completion of the entire Program for Immediate Action Concerning Lands as proposed in the document will require 1.46 billion cruzeiros, using funds derived from appropriations currently frozen in the 1991 budget as well as additional funds. These additional funds will finance the subprograms for the removal of miners and for the demarcation of 600 sq km of the Ianomami area.

Upon leaving the meeting Passarinho said he would discuss with Economy Minister Marcilio Moreira the release of funds to finance the removal of the miners, which will be accomplished primarily in Brazilian Air Force (FAB) helicopters.

According to the minister, approximately 660 million cruzeiros are scheduled for release shortly. Passarinho declared that the government can count on a grant of \$550,000 from the UN.

Rio-92 Secretary Garcia on Government's Environmental Policies, Debt Conversion

91WN0589A Rio de Janeiro *O GLOBO* in Portuguese
30 Jun 91 p 14

[Interview with Rio-92 Executive Secretary Carlos Garcia by Monica Medeiros in Brasilia; place and date not given: "Growth Without Destruction of the Environment"]

[Text] Rio-92 Executive Secretary Carlos Garcia—who is also secretary for administration, holds the rank of minister in the diplomatic service, and has been appointed by President Fernando Collor to oversee implementation of environmental policy—is raising some doubts as to whether the government has actually decided to implement the thesis of Secretary of the Environment Jose Lutzenberger concerning the need to change the economic model and the concept of development, or whether the government is not clear as to what it should do in this sector.

In an interview given to *O GLOBO*, Garcia emphasized the need for Brazil to develop and grow without destroying the environment, but also without undertaking a binding commitment to the protection and preservation of the environment, which is precisely the concept of development that Lutzenberger questions. The environmental secretary believes another form of economic progress must be found that is completely in harmony with the protection of the environment.

Garcia avoided commenting on the government's policy in this sector. He dodged the controversial Indian question, saying that he did not remember what was discussed at the meeting in which he had participated seven hours before the interview. He also was unable to speak with precision concerning the proposed decree dealing with debt conversion that the president has entrusted him with drafting.

[Medeiros] What are your new responsibilities in the environmental area?

[Garcia] During the meeting the president delegated me to draft a decree setting up the Committee To Evaluate Proposed Projects for Debt Conversion for Environmental Purposes. I did so. It is a small committee consisting of the minister of the economy as chairman and the minister of foreign affairs and secretaries of the environment and science and technology as the other members. The committee's executive secretary is the chief of the Department of International Affairs of the Economy Ministry. This is because the Department of International Affairs of the Economy Ministry is the organ of government that centralizes the analysis of international projects and contacts with intergovernmental banks.

[Medeiros] How will this conversion be effected?

[Garcia] That is spelled out in a Central Bank regulation whose final text I have not seen.

[Medeiros] But what is the nature of it, in general terms?

[Garcia] From what I understand, title to the debt will have to be donated, with the money involved becoming part of a national heritage fund; the yield from this fund would be used for environmental projects.

[Medeiros] The economic team rejected this idea because of the inflationary impact.

[Garcia] This formula removes the inflationary impact, because what is entering the economy is the yield—the interest earned by the national heritage fund—which pays for the projects. The principal remains in the fund.

[Medeiros] What will the fund yield?

[Garcia] That I do not know. That is the province of the Central Bank.

[Medeiros] Why did the president decide to implement this debt conversion program at the present time?

[Garcia] First of all, because the matter is on the principal agenda of the major countries of the world, and especially of Brazil, because the conference will be held here. This agenda is giving rise to a national debate over the relationship between the environment and development. The subject to be dealt with at the conference is not ecology; it is the environment and development. In other words, we have to grow—that is necessary—and we have to protect the environment. How then can both objectives be attained: development, and protection of the environment? That is the subject of the conference. It serves no purpose to adopt a conservationist policy that says we must preserve and protect everything. It serves no purpose, because the need for growth is inevitable. We need to grow in order to achieve an economic and social equilibrium in Brazil, and following such a policy will provide no solution. We can likewise not accept unrestricted growth—growth at the expense of the environment. Why not? Because growth at the expense of the environment is actually growth at our own expense. You would be sacrificing the patrimony that belongs to us and to the coming generations. An ecosystem once destroyed cannot be restored.

[Medeiros] Is the Debt Conversion Project a way to obtain funds?

[Garcia] This aspect should not be given much emphasis, because it is a small pilot project. It is not yet an unrestricted conversion. What the government has authorized is a pilot project involving a limited sum, to see how such a project functions. This is not the principal agenda for the conference, which is rather the debate concerning the environment.

[Medeiros] And what of Professor Lutzenberger's ideas concerning changing the economic model for development—ideas which have caused the government this time to pay attention to the professor?

[Garcia] Professor Lutzenberger has had the government's attention since 15 March 1990, when he was appointed secretary of the environment.

[Medeiros] But he was not having any success in gaining acceptance for his ideas.

[Garcia] On the contrary, the professor has had the government's complete support from the beginning.

[Medeiros] But the government's actions have not been demonstrating this. At the conference on the situation of the Ianomamis, he was not able to get the reservations demarcated—something he has always regarded as essential.

[Garcia] I was not present at that meeting, but what I heard at today's meeting was complete support for the professor's ideas, which are also the ideas advocated by the secretary of culture—who was among those present—and by the new president of Funai [National Indian Foundation].

[Medeiros] But it is obvious there has been a change.

[Garcia] I do not know that.

[Medeiros] Then what does the president intend to do concerning the proposal to change the economic model?

[Garcia] What the president will propose at these fortnightly meetings is that the entities of the government that deal with this matter proceed in a coordinated and harmonious manner.

[Medeiros] Why did the president decide to undertake the task of coordinating the Rio Conference?

[Garcia] These fortnightly meetings do not deal solely with the conference. They deal with the environmental problem. The conference is one of the items on the agenda.

Ship Oil Spill Damages Beach in Guarapari

PY2307191691 *Sao Paulo FOLHA DE SAO PAULO*
in Portuguese 20 Jul 91 p 5 Section 4

[Summary] An oil spill discharged from a still unidentified ship has affected nearly 10 km of beaches in Guarapari, 60 km south of Victoria, Espirito Santo State.

The State Secretariat for the Environment (SEAMA) is investigating the incident. SEAMA expert Jose Augusto dos Santos said that approximately two tons of oil were spilled. The secretariat suspects the Norwegian ship Amb Harpon might be involved.

Pilot Program Seeks To Preserve Amazon, Atlantic Forests

PY2707224891 *Rio de Janeiro O GLOBO* in Portuguese
22 Jul 91 p 14

[Text] Brasilia—The Pilot Program for the Preservation of Brazilian Tropical Forests will implement 49 projects—divided into two subprograms, one structural and the other demonstrative—in the Amazon forest. In addition, programs that have not yet been decided on will be implemented in the Atlantic Forest. Although the projects will cost an estimated \$1.5 billion, only the budget for the first 18 months has been detailed. During this period, \$280 million [as published] will be invested in the projects.

The structural subprogram is divided into the following projects: preservation and protection of relevant ecosystems, which includes proper land titles for parks and biologic reserves and the delimitation of Indian reservations by the end of 1992, costing \$79 million; handling of natural resources, emphasizing exploitation of fish and forest products, costing \$5.4 million; recovery of degraded areas, costing \$23.2 million; mapping, costing \$23 million; technological and scientific support, costing \$20 million; institutional strengthening, costing \$20 million; environmental education, costing \$877,000; monitoring and surveillance, costing \$21.4 million; and supervision and control, costing \$13.2 million.

In the first stage of the Pilot Program, \$37 million will be assigned to the demonstration program. These resources will initially be assigned to 20 projects under nongovernment entities that are working with Indian groups and local communities for the development of alternative techniques for handling forest products.

All projects of the Pilot Program, including the creation of preservation areas and Indian reservations, for which federal organizations are responsible, must be approved by a joint commission made up of an equal number of representatives of the Brazilian Government and the Group of Seven.

General Vows To Fight Internationalization of Amazon

PY2707222891 *Sao Paulo FOLHA DE SAO PAULO*
in Portuguese 23 Jul 91 p 1

[By Gustavo Krieger and Eumano Silva]

[Text] General Antenor de Santa Cruz Abreu, chief of the Military Command of the Amazon, has said that the Brazilian Army "will transform the Amazon into a new Vietnam" if developed countries adopt a concrete attitude on internationalization of the region. Abreu made these statements to congressmen on the Senate and Chamber of Deputies National Defense Committees during an 11 June visit they made to the Amazon at the Army's invitation. This statement was confirmed by the Army Public Affairs Center (Cecomsex).

As of 1800 on 22 July, Cecomsex had not reported on whether the Army has drafted a plan to turn the Amazon into a "Vietnam." According to Cecomsex, Abreu's statement must be interpreted as a personal opinion against any action directed toward the Amazon.

A nationalist doctrine has gained strength within the Armed Forces Command. A document issued in 1990 by the War College (ESG) talks about the possibility of Brazil resorting to war against an internationalization of the Amazon.

The document, which is titled "1990-2000 - Vital Decade" [1990- 2000 - Decada Vital], was coordinated by then ESG President Oswaldo Muniz Oliva. The ESG says that the international ecological preservation movement is generating "harmful beliefs, such as internationalization of the Amazon."

According to the document, "establishment of political bridgeheads may demand of authorities a great effort to eliminate them—even resorting to war."

The document states that the pressure to preserve Indian culture exerted by developed countries may lead to the adoption of international sanctions against Brazil. "These actions from abroad may disturb Brazil's permanent objective of social peace, besides going against our sovereignty. In order to turn away these threats, it may be necessary to turn the matter into a state of war."

Abreu's statement was confirmed to FOLHA on 22 July by three congressmen who attended the June meeting. Mauricio Campos, (PL) [Liberal Party] deputy for Minas Gerais State and chairman of the Chamber of Deputies National Defense Committee, has said that Abreu's statements "show that the Brazilian Army is ready to act against any attempt against national sovereignty."

Irapuan Costa Junior, (PMDB) [Brazilian Democratic Movement Party] senator for Goias, said Abreu's statement "was a reaction against the avarice of rich countries toward the Amazon." Francisco Rodriguez, (PTB) [Brazilian Labor Party] deputy for Roraima, backs the statement in the name of national military thought.

Government Sets Deadline for Formulating Environmental Policy

*PY2607031491 Rio de Janeiro O GLOBO in Portuguese
23 Jul 91 p 8*

[Jorge Bastos Moreno report from Brasilia]

[Text] The Brazilian Government has shown frustration over the position taken by the Group of Seven [G-7] (which consists of the richest, most developed countries) on the subject of aid to resolve the environmental problem. It was in this atmosphere that President Collor met with his ministers and secretaries yesterday to discuss the environment and the Indian issue. According to those who attended the meeting, the government has reversed its initial expectations for foreign aid prospects.

The World Bank, an institution from which the government expected broad support, has decided to disburse the funds earmarked for Brazil in three stages: First, an immediate disbursement of \$50 million; then, \$250 million between now and two years from now; and finally, \$1.2 billion in 1996.

Speaking to the ministers and secretaries attending the meeting, Collor said: Brazil must increasingly draw on its own forces to overcome its problems.

Collor set 30 September as the deadline for formulating an environmental policy. He also asked his aides to work hard on broadening their talks with the governors of Amazon Region states to seek a standardized position because, in his opinion, the federal government and state governments have similar positions on this subject, only greater coordination is needed. The president thus referred to the Amazon Code proposed by Amazonas Governor Gilberto Mestrinho, who suggested that Ibama [Brazilian Institute for Environmental Affairs and

Renewable Natural Resources] be stripped of its jurisdiction over the Brazilian rain forest.

At this time, the government considers it essential to promote domestic cooperation and understanding to formulate an environmental policy in the country. During the meeting, Ibama President Tania Munhoz submitted a report on the environmental situation in Brazil. This report will be discussed with the governors and environment-related national institutions to formulate a policy for this sector.

Foreign Minister Francisco Rezek was charged with drawing up guidelines for discussions with the Amazon governors. Justice Minister Jarbas Passarinho will coordinate these discussions and Egberto Baptista, secretary for regional development, will act as his secretary.

Collor Signs Decree on Protecting Ozone Layer

PY2807013291 Brasilia Voz do Brasil Network in Portuguese 2200 GMT 24 Jul 91

[Text] Brazil plans to reduce—in the short term—the use of chemical substances, such as sprays, that affect the atmosphere's ozone layer. This was established in a decree ratifying the Montreal Pact signed by President Fernando Collor today.

Under the Montreal Pact, which was signed in Canada in 1987, several countries, including Brazil, committed themselves to bringing forward deadlines for the elimination of industrial chemical products that damage the ozone layer.

The ozone layer protects the earth from the sun's ultraviolet rays, which can cause diseases such as skin cancer.

CHILE

Santiago Implements Emergency Antipollution Plan

*91WN0568A Santiago EL MERCURIO in Spanish
14 Jun 91 pp A1, A15*

[Text] On 13 June the Pollution Commission announced the implementation of the Emergency Plan, with the suspension of elementary and pre-elementary school classes and a 40 percent reduction in the operation of motorized vehicles with license plates ending in 0, 9, 1, and 8 in the Province of Santiago between 0700 and 2030.

Among the measures which also have been ordered is a 50 percent reduction in the activities of large, fixed sources of pollution (188 industrial activities). Furthermore, the possibility is being considered of restoring vehicular restrictions on a permanent basis during periods of continuing, critically high pollution. This was stated by Eduardo Arriagada, president of the Special Pollution Commission.

Even with the 40 percent reduction in the vehicular flow more than 6,000 small, feeder buses continue to circulate in Santiago. (There are more than 10,000 such buses in Santiago.) About 270,000 automobiles will continue to

circulate (out of 450,000 automobiles registered). This information has been provided by the regional secretary of the Ministry of Transport.

At a meeting held on 13 June representatives of the Special Pollution Commission, the Ministry of Transport, the Metropolitan Environmental Health Service, and the Meteorological Directorate of Chile issued an evaluation of the environmental situation which Santiago is experiencing. The evaluation states that the level of pollution continues to be in a range which is "dangerous for human health," because the indices of air quality, although they have not worsened, remain above the level of 500.

Nevertheless, according to information from the Meteorological Directorate of Chile, a slow improvement began on 13 June. It is expected that by 17 June conditions will be more favorable.

The Special Pollution Commission asked the citizens for maximum cooperation and respect for these measures which seek to protect their health. It placed special emphasis on warning against engaging in activities which add to pollution (such as using their automobiles, lighting fires in fireplaces over the weekend, burning garbage, etc) and exposing persons subject to high risk, such as children and persons with chronic respiratory and cardiovascular illnesses.

Thermal Inversion

The effects of pollution have been caused by the phenomenon of "thermal inversion," Dr. Osvaldo Gonzalez of the Meteorological Directorate of Chile explained. He indicated that this situation happens every year in autumn and winter. He said that, due to the geographic location of the city of Santiago, climatic characteristics place it under very high pressure anticyclonic conditions. The thermal effect is a distribution of temperature which, instead of diminishing with altitude, increases, particularly at lower levels. As a result the vertical movement of air declines notably, preventing dispersion of the pollution.

He pointed out that the Meteorological Directorate has undertaken a number of actions, among them, distributing meteorological information which may help the appropriate authorities to make the necessary decisions.

He added that in cooperation with the University of Chile and the administrative authorities of Santiago [Intendencia Metropolitana], a study is being made of the meteorological potential of the environmental pollution of Santiago. The study, which will cover a period of two years, will define the meteorological factors which produce high concentrations of pollution.

Long Term Actions

Eduardo Arriagada stressed that actions to reduce pollution in Santiago include very technical measures which will cost a great deal of money.

He said: "Our plan is aimed at lowering in a permanent way emissions from fixed and movable sources of pollution (factories and vehicles). That does not mean closing down factories but rather installing the necessary equipment so that they can operate without polluting the atmosphere. Placing filters in factories which carry on processes polluting the air is something which cannot be accomplished between one night and the following morning."

He added: "It is not possible to change the motors in the microbuses as rapidly as possible, because this would require that each owner have at least \$10,000 to buy a new motor and install it. That cannot be done in one minute."

He said that installing catalytic converters in automobiles is also a measure which takes time.

Furthermore, he added that the actions which the citizens can take have only a small effect, since 70 percent of the pollution comes from burning diesel petroleum fuel.

Technical Inspection

The regional secretary of the Ministry of Transportation, in referring to the alleged inefficiency of the system of technical inspection of mass transportation units, which has been mentioned by some groups, admitted that this happens in some cases. He pointed out: "It happens that there are companies engaged in renting out certain spare parts so that the vehicle will pass inspection."

He explained that this process involves a double effort: to improve the standards and the quality of the technical inspection system and a continuing effort to check violations of the procedure.

Susceptible Groups

Dr. Luis Martinez, chief of the Division of Health Programs of the Ministry of Health, said that the groups of people most susceptible to illness due to high levels of pollution involve adults and minors who suffer from chronic, respiratory infections.

Official figures indicate that, in addition to adults who suffer from asthma or chronic bronchitis, 25 percent of the 200,000 children in Greater Santiago who are not yet weaned could have one of these diseases.

Dr. Martinez declared that, according to reports received from the various health services and emergency health centers, the general increase in numerical terms of calls on doctors and cases of medical attention provided during the past few days in Santiago shows a rise similar to that recorded during the 1990 winter season.

He stated that, in percentage terms, the increase in medical attention ranged between 40 and 70 percent, indicating that those additional margins reflect respiratory illnesses in minor children.

He brought out the fact that, if the present levels of pollution continue, the probability exists "that at certain times and in some services there will be an avalanche of demand for care of respiratory complaints."

Regarding the increase in carbon monoxide, Dr. Martinez stated that this gas "could have a prejudicial effect on those persons who suffer from cardiovascular conditions. Such conditions do not develop in the course of a single day. We need a broader analysis of the information to be able to measure the extent of these situations."

Dr. Martinez repeated the need for mothers to avoid taking their children to places where there is a greater level of pollution (for example, the center of Santiago), recommending that they be especially careful of sources of pollutants in the home (kitchens and stoves).

Clarification of Two Deaths

Asked about the case of two children being fed on mother's milk in the northern part of Santiago who arrived dead at Roberto del Rio Hospital, Dr. Martinez confirmed the fact of their death. However, he stated that there is no evidence which would make it possible to associate these deaths with factors of pollution. He added that those two deaths are not even considered suspicious.

Abbreviated Attention

Dr. Martinez reminded the people that the Ministry of Health has a special plan under way to attend to respiratory illnesses in children, which operates through a system of abbreviated attention.

The method is being used in the various medical consultation centers in Greater Santiago, which have been provided with the necessary personnel and medical equipment to tend to minors and breast fed children without requiring their mothers to take them to the hospitals.

Five Percent Violators

Colonel Julio Nanjari, the prefect of traffic, stated on 13 June that violations of the emergency measures adopted in the public transportation sector and in particular as a result of the high indices of pollution has not involved more than five percent of the vehicle operators.

He stated: "From our point of view the checks which we have made have had positive results. The emergency measures have been applied, and the public has understood that we are facing an extremely serious situation."

Regarding those who violate the emergency regulations, he said that they give many reasons for not obeying the law, such as inadequate information, ignorance of the measures, or other reasons. When they are caught in the act, they are notified of the violation of the law so that they may appear in court.

In the case of mass transportation he stated that as a whole this sector has obeyed the restrictions, and there have been no problems with them.

He called on vehicle users to understand the emergency situation which the city is going through and cooperate by making use of mass transportation facilities.

COLOMBIA

Bogota Pollution Control Plan Proposed

91WN0583A Bogota *EL TIEMPO* in Spanish
11 Jun 91 p 1E

[Article by staff writer Leonel Bejarano]

[Text] The proposal is part of a package of measures submitted by the Administrative Department of the Environment [DAMA] and the District Secretariat of Health to the mayor for his consideration, aimed at decontaminating the air in the capital.

During the next few days, Bogota will take its first big step aimed at a major environmental goal: decontamination of the air.

It involves a series of control measures to be implemented by the district administration, based on studies made by the District Secretariat of Health and the Administrative Department of the Environment.

In brief, it is proposed to restrict selectively the transit of private vehicles along certain city routes; to use compressed natural gas as fuel in government vehicles, by way of a test; to make the installation of catalytic filters in cars compulsory; and to arrange with the Colombian Petroleum Enterprise (ECOPETROL) an improvement in the quality of motor fuels.

The restriction would be in effect on the sections of roads usually recording the most congestion. The final digit on the plate and the so-called "peak" hours would be taken into account.

It is also suggested that, on Mondays, the measure be applied to vehicles with plate numbers ending in 0 or 1; on Tuesdays, 2 and 3; on Wednesdays, 4 and 5; on Thursdays, 6 and 7; and on Fridays, 8 and 9. On Saturdays and Sundays the measure would not be in effect.

According to the proposed system, traffic would be banned between 0600 and 0900 hours, and between 1700 and 2100 hours.

Nevertheless, the possibility has not been precluded that, depending on the conditions in each corridor, the schedules might be extended in some, or a new interval might be authorized.

For control and monitoring, the vehicles will have a sticker on the upper left corner of the rear window. This will be provided free of charge, and will have a color based on the pertinent restriction day: yellow for those that may not travel on Monday, blue for Tuesday, black for Wednesday, green for Thursday, and red for Friday.

The routes to which the measure would initially be applied are: Caracas Avenue, between Los Heroes and 8th Street; Highway 7, between 6th Avenue and 127th Street; the Northern Expressway, between Los Heroes and 134th Street; Boyaca Avenue, between the Southern Expressway and its northern end; Jimenez Avenue, between Highway 3 and Highway 10; 68th Avenue, between Centenario Avenue (13th Street) and its

northern end; Colon Avenue (13th Street), between Highway 10 and Boyaca Avenue; Avenue of the Americas, between Highway 30 and the Banderas section; Highway 30, between 6th Avenue and the Northern Expressway; the Expressway to Medellin, between Caracas Avenue and Boyaca Avenue; May Day Avenue, between Caracas and Boyaca Avenues; Highway 10, between May Day Avenue and 26th Street; the Southern Expressway, between May Day and Boyaca Avenues; and the Avenue to Suba, between Rodrigo Lara Avenue (127th Street) and Espana Avenue.

Gas and Filter

One of the proposals attracting the most attention is that for using compressed natural gas as fuel for vehicles. By way of a test, it would be used first in the official cars of the district administration.

In addition to its environmental feasibility (50 percent less pollution), the gas is advantageous because of its profitability. Its cost is approximately 40 percent lower than that of gasoline, and its performance is better.

According to data from Neivana de Gas, the cost of converting the engine of a vehicle to use compressed natural gas is 400,000 pesos, at March 1991 prices.

The third planned measure is to require the installation of catalytic converters in vehicles, and to make good maintenance of the carburetion system in cars compulsory.

The converter is a filter that is installed in the car's exhaust to retain the polluting gases and convert them into water vapor. Imported, it would have an average price of 100,000 pesos; and for its perfect operation the car must necessarily be in good carburizing condition.

This equipment would be a compulsory requirement for the issuance of driving permits.

As a supplement, talks are being held with ECOPETROL to limit the lead and sulfur content in gasoline, diesel fuel, and oil for stoves. There has already been some progress in this respect. The use of "green gasoline," which is geared to the international requirements for protecting the atmosphere, has been announced.

HONDURAS

Deforestation Threatens Islas de la Bahias; Government Inaction Cited

91WN0551C San Pedro Sula *LA PRENSA* in Spanish
27 May 91 p 33

[Text] Roatan—Over the past several months, forests in the Islas de la Bahia have been burned and cut down by unscrupulous persons who set fire to the green areas of Roatan Island in order to hunt reptiles.

Large, forested areas have been cut down and then burned, and no government authority has done anything to stop this indiscriminate, criminal action against the soil of this area.

Tourist areas have lost their natural beauty, due to the indiscriminate felling of trees.

The regional office of Renewable Natural Resources (Renare) and the municipal mayor's office are unable to deal with the tens of fires which occur everywhere in the community. The organization for the protection of the environment, established by the wife of the governor, has not been able to stop these criminal activities by a number of citizens.

It is urgent for the government to take an interest in protecting the national forests, particularly in this sector, where the soil is thin and sources of drinking water are drying up as a result of what has happened.

The government's help is needed to begin immediately a campaign of reforestation of Roatan and Guanaja Islands, which recently have lost the beauty which they once had.

Official Sets Cost of Reforestation at \$566 Million

91WN0551B Tegucigalpa *EL HERALDO* in Spanish
28 May 91 p 29

[Excerpts] Honduras needs about 3.0 billion lempiras to reforest 2.0 million hectares of forest which have been destroyed over the past 20 years. This amount of money is equivalent to one-sixth of the external debt of the country.

About 82 percent of the total surface of the country is made up of land devoted to forests, where 23 percent of the total population lives.

In 1982 it was estimated that 3.0 million hectares were covered in pine trees, while 4.4 million hectares were covered in hard wood or broad leaf forests of oak and mahogany, among other trees.

According to data provided by Miguel Angel Salazar, chief of forestry protection of the Honduran Corporation for Forest Development (Cohdefor), the cost of reforestation per hectare is estimated at 1,500 lempiras.

On the basis of this figure Honduras needs about 3.0 billion lempiras, equivalent to \$566 million, to reforest 2.0 million hectares.

The official regretted the fact that this large area has begun to deteriorate, due to a series of activities which eliminate the forest cover.

Shifting agriculture, extensive cattle ranching, and forest fires, among other things, are the decisive factors in deforestation.

The cattle rancher is interested in pasturage, not in trees, and when the forest cover is lost, the volume of water also declines every day, since pasturage does not have the capacity to absorb water or perform the function of controlling the hydrographic basins.

If extensive cattle raising and shifting agriculture continue, the problem will be all the greater in a not very

distant future, Salazar warned. He emphasized that between 80,000 and 120,000 hectares are destroyed annually. [passage omitted]

The second factor in the destruction of forests is the process of cutting firewood, since seven out of every 10 Honduran homes cook their food with firewood which, furthermore, is used as the principal fuel for small industry, such as bakeries, brickworks, tile works, and lime kilns.

He said that it is urgent to define the limits of agriculture and to restrict the amount of land used to pasture cattle, in order to reduce the number of hectares of forest destroyed each year.

Guevara stated that about 3.0 million seedlings per year are planned to be planted, which means the reforestation of 3,000 hectares. He admitted that this objective is not being achieved since the majority of the seedlings planted do not receive adequate care and therefore die. [passage omitted]

According to data provided by Cohdefor, there are now 2.4 million hectares of pine forest, of which 1.0 million hectares are in commercial forest and 1.4 million in young forest, as well as 2.6 million hectares of broad leaf forest, of which 277,000 hectares are in mangrove forest. [passage omitted]

Destruction of Deciduous Forests Continues

91WN0551D Tegucigalpa *EL HERALDO* in Spanish
30 May 91 p 41

[Article by Dagoberto Irias and Gerard Szaraz]

[Excerpts] 1 May 1991—As in the majority of tropical countries the deciduous forests of Honduras run the risk of disappearing over the near term. It is calculated that deforestation of this kind of forest amounts to about 80,000 hectares (two percent) per year. If this tendency continues, in a period of no more than 20 years these forests will be only relics of the past. There are several consequences of the destruction of tropical forests. At the world level it is related to changes in climate, the

reduction of biodiversity, and the decline in the productivity of the soils. At the local and regional level it has a direct relationship to the economic and social development of the people affected. At the same time it has been demonstrated that you cannot establish forest reserves and ignore the needs of the peasants, whose subsistence depends on the forests. These two problems, that of the peasant and that of the forest, are intimately linked. [passage omitted]

Of the 1.3 million hectares which make up the deciduous forested area of Honduras 750,000 hectares are in a rugged, mountainous area with slopes greater than 50 degrees. In 1990, of this mountainous area 580,000 hectares were covered with forest, only 16,000 hectares of which consisted of pine trees. This tells us that 170,000 hectares of land clearly suited to forests are being used improperly. If we consider such other factors as soils and rainfall, the area subject to over use increases to approximately 200,000 hectares.

For the majority of the peasants who have no other alternative, a deciduous forest is regarded as a land reserve to be cleared. This is a process which requires great effort to gain a precarious subsistence, based on a marginal kind of agriculture. Extensive cattle ranching is another important factor in the destruction of deciduous forests. This activity goes on both in agricultural lands, with a consequent waste of its productive capacity, as well as land on the sides of mountain which is eminently suited to forest.

The systems of production are rudimentary, both for annual crops as well as for the small amount of perennial plants which the peasants have. The most common system is the traditional practice of slash and burn, leaving the land to lie fallow. The land is used for the production of basic food grains. Forest activity is also rudimentary in character, based principally on felling the trees with an ax and cutting them up with a hand saw. Primary transportation is by river, mule, or human power. This operation is highly selective, as 97 percent of the trees extracted, by volume, consists of only four species: mahogany, cedar, redondo, and laurel. [passage omitted]

REGIONAL AFFAIRS

New Focus on Water Resources Urged for Arab Countries

91WN0494A Cairo *AL-WAFD* in Arabic
16 May 91 p 10

[Article by Mughawari Shihatah Diyab: "The Water Crisis Will Be the Cause of the Next Middle Eastern War"]

[Text] It is an inescapable fact that the world now suffers to one degree or another from crises in renewable, usable resources. Some of the world's regions suffer from a shortage in the quantity of fresh water, some regions suffer from the quality of the water, and others suffer from a problem of both quantity and quality.

In fact, if we look at the overall balance of fresh water in nature, we would see that the total volume of water on the globe is estimated to be about 1,400 million cubic kilometers, of which 97 percent is the water of seas and oceans, which is salt water, and that three percent, most of which is found in the form of above ground and underground water, is distributed in the following manner: 0.03 percent is river water, and 24 percent of the total three percent that is fresh water is underground water. Looking comprehensively at the Arab nation, we see that there is a crisis in the balance of fresh water and that this crisis will intensify and increase in severity if immediate and decisive measures are not taken to contain it.

We would like to stress that fresh water resources are important and necessary not only for drinking, industry, and domestic use, but also for food production, especially of the grains, of which the Arab world imports 60 percent of its need.

It is certain that the vast areas of land of up to 15 million square kilometers include millions of feddans that would be arable if they were provided with the necessary factor of water. Thus it can be said that the food gap from which the Arab world suffers is in fact a crisis in the balance of water of the Arab world. According to reports available on the Arab world, the water balance needed to cover the total needs of its population now and in the future can be summarized as follows:

First: It is expected that by the year 2000 the population of the Arab world will reach 265 million, and in 2010 it will be 285 million; in other words, the population is growing at a rate that varies between 2.9 and three percent, according to statistics done by UNESCO.

Second: according to statistics done by agencies such as UNESCO, the total cultivated land in the Arab region overall is 45 million hectares—"108 million feddans." As for irrigated land, its area is 10 million hectares, which is equal to 24 million feddans.

Third: by examining the reports and statements coming from UNESCO in 1988 on the water balance demand and supply for the Arab nation which was calculated for 1985 as follows:

1. Currently, 139,853 million cubic meters of surface water resources are utilized; of underground water resources, 22,552 million cubic meters; and of other resources, "rain, fog, etc.," 9,724 million cubic meters, for a total of 172,129 million cubic meters.

2. The demand for drinking is 7,016 million cubic meters; industry, 1,344 million cubic meters; and agriculture, 296,602 million cubic meters, for a total of 304,962 million cubic meters.

3. The 1985 deficit, $304,962 - 172,129 = 132,832$ [as published] million cubic meters. We must surmise the extent of the expected deficit in coming years in light of the population increase just to maintain current activities as they are now. It is clear from that that there is a deficit of about 44 percent between water supplies and demand, and it is obvious that this deficit has increased over the past five years.

If we suppose an increase of 0.5 percent a year in the area of land put under irrigation, which is less than what can be projected in light of the large increase in the population, then irrigation needs alone will increase from 80 to 160 billion cubic meters a year until the year 2000. The deficit will increase in the countries situated on the African continent in particular because of their climatic and development situations. This deficit can be overcome only by the development and exploitation of underground reserves in the Arabian Desert, judicious use of water, the use of advanced technological methods, the recycling of drainage water, and the use of technological methods in the field of research on the extraction of underground water, as well as the use of advanced means to desalinate sea water.

Moreover, the unification of efforts to discover unstudied areas, and working to evaluate the quality and quantity of the underground reserves ought to result from a comprehensive visualization of the geologic structure and hydrologic situation, as well as lead to better exploitation of water resources. It should be mentioned that laying down a unified policy on the exploitation of underground reserves based on scientific planning that relies on confirmed data will help to close the deficit in the water balance.

A review of the current methods of dealing with surface water resources, such as rivers and rain, or underground water, such as the water reserves in the Arab nation, will result in reducing the deficit previously referred to.

All this requires that scientific programs be established immediately to decisively confront this problem, especially since the rivers upon which the Arab world primarily depends arise outside of the Arab nation, such as the Nile, the Euphrates, the Tigris, the Jordan, the Shebeli, and the Juba. This leads us to the painful fact—the world conflict which radically changed its map during the past few months.

We should mention what Israel is doing in the way of repeated attempts to appropriate the greatest share of the supply of the Jordan, Hasbani, and Litani Rivers, and that it is busy implementing projects for storing water

resources at the expense of the share of the Arab countries, which affects the development of these states, and enables Israel to expand in the occupied Arab land and built settlements to settle immigrating Jews.

The Arab League must give attention to protecting water resources, which would ensure real development of the Arab countries through which these rivers flow.

Uzbekistan's Torrential Rains Attributed to Kuwait Oil Fires

*91WN0559A Moscow PRAVDA in Russian
19 Jun 91 p 1*

[Report by PRAVDA correspondent A. Kaipbergenov: "An Answer for the 'Experts'"]

[Text] Tashkent—Rumors have been widespread in Uzbekistan recently, caused by the recent and unprecedented torrential rains that have brought a host of disasters to farmers. Some "experts" are asserting that the precipitation is supposedly caused by the incompetent use of technology to cause artificial rain purchased from Japan.

The republic newspaper PRAVDA VOSTOKA attempted to dispel the rumors. The editors turned to specialists. Hydrometeorologists feel that the cause for this abundance of precipitation must clearly be sought in another direction—the Persian Gulf region. The Kuwaiti oil fires, or more precisely the clouds of smoke, have disrupted natural environmental processes.

Kuwaiti Oil Well Smoke Damages Forests, Pastures in Iran's Fars Province

*LD2507091391 Tehran IRNA in English 0723 GMT
25 Jul 91*

[Text] Shiraz, Fars Prov., July 25, IRNA—Provincial officials in Shiraz said Wednesday that because of black rain originating from the airborne smoke from burning oil wells in Kuwait, the woodlands and pastures in Fars province had sustained substantial damage.

About 4.5 million hectares of the nearly nine million hectares of woodlands and pastures in the province have sustained about rls. 150 billion due to the premature drying of grass, vegetation and flora.

EGYPT

Al-Munir Area Residents Protest Nuclear Waste Dumping Violations

*91WN0527A Cairo AL-JUMHURIYAH in Arabic
7 Jun 91 p 5*

[Report by Mahmud Nafi']

[Text] The time: the peak of the noontime heat.

The place: the al-Munir area, the Mashtul al-Suq administrative district, the governorate of al-Sharqiyah, 45 km from Cairo.

The subject: a disagreement between the Atomic Energy Authority and several citizens over a plot of land in the area, which all official agencies in the state have ruled belongs to the citizens occupying it.

Not pleased with this situation, the Authority decided to seize the land in an atomic war! Officials and scientists in the organization came, preceded by bulldozers and large cranes carrying large atomic tombs, which they dropped into the ground in defiance of the owners. Whoever has no need for his life, let him come near!

The details of the incidents:

Police report No. 270/10. Circumstances: Mashtul al-Suq, the governorate of al-Sharqiyah, 28 May 1991, submitted by Thirwat al-Mursi and six others against Dr. Fawzi Hammad, the head of the Atomic Energy Authority.

The police report states that the head of the Authority initiated a real, atomic war at the site of the disputed land in order to seize it by the force of an atomic weapon. It adds that the complainants desire to oppose the Authority and to strive to remove weapons of mass destruction from the region!

Victims of the Atom

Thirwat al-Mursi and Fawziyah Shahab, the owners of the land, recount the tragedy:

We paid heed to the government's call to reclaim and sow the land. We sold our valuables, and we have been on the land since 1976. We wanted everything to be according to the law. The land belonged to the agricultural cooperative in the al-Munir area. We obtained agricultural tenancy cards pertaining to it in 1978. And we put our shoulders to the wheel and began to plant.

In 1987, the Atomic Energy Authority, which owns, adjacent to us, a large plot of land enclosed by a familiar concrete wall, surprised us by destroying sections of the wall near the boundary of our land. With the naivete of law-abiding people, we said: By God, they are respectable people. They must be reinforcing their walls further to protect us from radiation damage if they conduct any activities or experiments near our land.

However, we were shocked when we discovered them building new walls on our land, encroaching on it and taking control of 45 feddans.

As reasonable people, we pondered the matter. We said: This is a governmental agency, and only the government stops the government.

We went to the public prosecutor's office of Mashtul. After an investigation and an inspection, the public prosecutor's office decided, according to its report No. 1098 of 1987, to notify the Authority of the need to cease construction operations.

Actually, the decision of the public prosecutor's office was implemented. We believed that the Authority had regained its senses, and we returned to farming.

However, the Authority was preparing for war. Last month, it attacked our land with an atomic weapon.

The War of Mashtul

Thirwat al-Mursi and Fawziyah Shahab went on with their story:

On that day, the people of Mashtul stopped. They could not believe what was happening: bulldozers, scientists, and large concrete tombs, on which was written, in the color of blood, "Danger, Radiation—the Atomic Energy Authority."

In the blink of an eye, the bulldozers were operating on the land, carrying tombs and penetrating the owners' boundaries through a hole in the old wall.

Scientists used megaphones to warn the landowners to clear out if they wished to be saved. The land is disputed, a large cemetery for nuclear waste!

The residents and the owners opposing the bulldozers—indifferent [to the risks]—were actually able to prevent a large number of bulldozers from entering. The attackers managed to place only one atomic tomb in the ground. They then retreated with the rest of the tombs, while several citizens hurried to inform the police and the public prosecutor's office.

In the evening, the Authority invaded the site again with bulldozers. However, the owners and the residents were lying in wait for them and forced them to flee.

The atomic war continues to rage to this day.

The Security Council

With the goodness of a native daughter, Fawziyah Shahab went, during the battle, to Dr. Fawzi Hammad, the head of the Atomic Energy Authority, who had himself been at the site on the day of the war.

She told him in grief: Doctor, you are a great scientist and well aware of the significance of the danger posed by the radiation which you are using to fight us now. Obey God in your science. Even if this land actually belonged to the Authority, that would not justify fighting us with the atom to seize it.

The head of the Authority did not comment, he only shook his head, telling her: God willing, everything will be all right!

As for Thirwat al-Mursi, he went to the public prosecutor's office of Mashtul, and wrote out official report No. 1220, misdemeanors. According to him, he has been the most hurt by this war, inasmuch as one of the bulldozer drivers, on the instructions of an official in the Authority, used his bulldozer to lift him onto a tomb of waste and plant him with it in the ground as punishment for opposing them.

It seems that he was exposed to a large dose of radiation, and he has since complained of headaches, nausea, and a sharp pain in the throat.

Thirwat al-Mursi states: If the official agencies in this state had not taken my right, I would resort to international organizations that oppose the use of the atom and call for the elimination of weapons of mass destruction.

He adds that officials in the Authority said that this site has been used as a nuclear burial site for 25 years, and that they consider this period an indication of their ownership of the land. If this is correct, it is an indication of the perpetration of a scandalous crime. Why did they permit the people to cultivate, eat, and drink, and work together over a nuclear tomb that has radiated death throughout all of these years without warning them?!

What the Documents Say

However, what is stated in the documents regarding this dispute?

The Surveying Directorate and the Lands Administration in the governorate of al-Sharqiyah, to which the land is subordinate, ruled on the problem. Regarding the northern border which is the subject of the dispute between the Atomic Energy Authority and the owners, they affirmed that the disputed land falls outside the boundaries of the governmental project of the Atomic Energy Authority and does not belong to the Authority. Rather, it is subordinate to the al-Sharqiyah Land Administration. As for the owners, they are represented by Thirwat al-Mursi Hasan in his capacity as an occupant, along with others, on 102 feddans, according to the letter of the al-Sharqiyah Lands Administration, no. 707, dated 9 March 1991.

Nonetheless, the Atomic Energy Authority does not acknowledge the statements of the Surveying Directorate or the Lands Administration in al-Sharqiyah.

Unconscionable

According to Dr. Fadil Muhammad 'Ali, a professor of nuclear physics at Cairo University's College of Sciences, it is unconscionable that Egypt's scientists, who are the first line of defense for our people against nuclear dangers, would consider harming the people without further ado.

The existence of stores of nuclear waste means that there are international standards that have actually been enforced. The mere placement of a tomb of waste and the posting of a warning sign means that there is a nuclear danger posed to any person, animal, or plant at the site. The radiation level in this area exceeds the standard. Consequently, no one passes through or approaches [the area], because the dangers are great and endless, according to the dose of radiation. Exposure of humans leads to anemia in the simplest of cases and to the destruction of some cells of the body. It can also damage the hormonal system, which controls all of the body's functions, producing an imbalance that ultimately leads to death.

Exposure of pregnant women leads to the deformation of the fetuses in their wombs. Exposure of youths might

disrupt pubescence, and if puberty does occurs, the sperm dies. In addition, there are the risks of cancer of course.

Whatever afflicts human beings also afflicts animals and poultry.

Therefore, Dr. Fadil cannot believe that this is happening or that any person alive would dare to do it. In general, he advises, if a radiation warning sign is posted, no person, animal, or plant should be within 100 meters of it. Such a warning must be heeded.

In his opinion, the issue of whether the disputed property belongs to the Atomic Energy Authority or the people is secondary.

Despite the danger and the warnings, AL-JUMHURIYAH felt compelled to go to the site to see and to photograph what is happening to nature. The result is this report. May God protect us!

Lake al-Manzalah Threatened by Pollution, Development

91WN0550A Cairo AL-AHALI in Arabic 12 Jun 91 p 6

[Report by Hana' al-Banhawi]

[Text] The crime of the destruction of the fish resources in Lake al-Manzalah is continuing. Despite all of the warnings, other parts of the lake in the area of al-Bashtir and al-Jankah are now being drained, and a part of the most important area of al-Jamil is being exploited for the construction of a land road from the Straits of al-Jamil to Port Said Farm. However, the problem goes even further. Sewage from more than six governorates is flowing into the lake, polluting it and damaging and endangering fish resources and human health. How long will this pressing problem continue to be unsolved, even though it has been discussed in numerous conferences and in the People's Assembly?

The area of the lake used to be 750,000 feddans. However, large areas of it have been drained. Thus, it contracted to 450,000 feddans, then to 350,000 feddans, and then, recently, to only 190,000 feddans. In a new report, the National Research Center warns of the exposure of the area that has not been drained to usurpation by violators of the law, who are turning it, for all to see and hear, into artificial islands called crowns [al-'alawi] and dams to collect the fish yield and process it into fodder for cattle. This has diminished the lake to the point where its area is not compatible with the number of fishermen on it, which totals 100,000, of which 2,500 are licensed to fish by the Lakes Institute. If the drainage continues, will the lake, whose fish stock is estimated at 330 million kg, be able to continue its role of supplying the country with a large amount of fish, which accounted for 65,000 tons out of a total annual production of 300,000 tons according to 1987 statistics?

The Retardation of Our Children!

The pollution represents a major disaster that threatens both fish and human life. Reports prepared by al-Mansurah University, the Environmental Protection

Agency, and the Water Research Center emphasize that the increased percentage of pollution in the lake is exposing our children to the risk of mental retardation. The lake receives approximately 4,950 million cu km [as published] of sewage from the sewers of Bahr al-Baqr (42 percent), Qadus (23 percent), al-Matariyah Station (three percent), Ramsis (four percent), al-Sarw (seven percent), Port Said (two percent), and reclaimed land (11 percent). Added to that is the agricultural drainage water from the drainage canals of Qadus, Saft, al-Sarw, and Ramsis—water which includes the residues of agricultural pesticides and chemical fertilizers. It is taken for granted that these toxic byproducts are affected by the chemical properties of the water and have weakened the immune system of fish, which have become easy prey for parasites that transmit diseases to human beings.

Japan's Experience

What is happening in Lake al-Manzalah arouses the astonishment of a leading aquatic biologist, Dr. Hamid Jawhar. He states: Before the sewage is disposed of in the lake, its components should be studied to ascertain the percentages of toxic materials in it, because these materials ultimately become concentrated in the human body and afflict it with highly dangerous diseases.

Regarding the change in the lake's character due to pollution and drainage, Dr. Jawhar emphasizes that this change will affect fish fertility and will lead to the disappearance of some types of fish. A primary indication of such a development is what is happening in Lake Qarun, which gained renown for producing the best types of Nile bolti [Tilapia nilotica, a food fish of the Nile] before that fish disappeared as the result of untreated sewage water. Jawhar calls for remedying the matter before it is too late. He indicates that there is not the slightest concern for water resources, even though they provide production that does not require much capital. Why do we not benefit from the experience of Japan, which has depended on the water for food that is very effective in developing cerebral capacities. This is Dr. Hamid Jawhar's call. Is anyone responding?

The Lake of Death

In his study, for which he chose the title "Lake of Death," researcher Ahmad Hani discloses the danger posed by the level of pollution in Lake al-Manzalah, which exceeds internationally permitted safety limits. In addition to silt, the lake receives the sewage of Greater Cairo, Port Said, Damietta, Ismailia, al-Daqahliyah, and al-Sharqiyah, as well as the untreated, unpurified waste of hundreds of factories, workshops, and plants, from the factories of Shubra to the factories of Port Said. Hani states that this has led to an increase in the percentage of toxic residues, which have afflicted the fish with bacterial diseases, according to the results of analyses performed by the Suez Canal Authority, which are contained in a report issued by the authority last February. Other reports, issued by the People's Assembly, blame pollution for the affliction of people with malaria, kidney failure, and cancer.

Emergency Plan Needed

An official source at the Environmental Affairs Agency acknowledges the dimensions of the danger, emphasizing that the rate of increase of waste in the lake has helped to consume oxygen and kill a large portion of the fish in the lake, in addition to affecting ground water in the area. Therefore, according to the official, preparation of an emergency plan was begun in cooperation with the Public Works Ministry, the Agriculture Ministry, the Fish Resource Development Authority, and the governorate to clean the straits and the lake, at a cost of 3.5 million Egyptian pounds. The plan is being implemented over a period of almost six months, after which it will be possible to evaluate the situation and ascertain the extent of the environmental balance in the lake. He also stated that work on the sewage plant at al-Jabal al-Asfar will be completed in 1992, and that several sewage plants are being built in the eastern delta, in al-Daqahliyah and al-Sharqiyah, to lighten the load of the Bahr al-Baqr land drainage canal, which is the largest land drainage canal that flows into the lake.

The Authority Responds

All of the statements and studies highlight the danger of the situation. This was emphasized by 'Id Muhammad al-Sumri, the head of the fishermen's guild at the lake. He states: We were surprised in 1982 by the decision to drain the northern lakes. We disapproved of and rejected it. A committee was formed to study the situation. It emphasized that Lake al-Manzalah is among the best lakes in terms of production, inasmuch as production continued to increase until 1985, when the executive leadership was changed and conditions at the lake began to decline. Al-Sumri emphasizes that the problems began when the Fish Resource Development Authority was established in 1983. Since then, the lake's fishermen have expressed their need for the authority's material and scientific assistance to eliminate obstacles, but it has not responded.

Al-Sumri notes that the ministry's Fish Resource Affairs Agency used to set aside sums for the council of the city of al-Matariyah to remove obstacles impeding fishing activity and to finance fish raising. However, those efforts ended after the authority was established, which led to an increase in dam construction activity and a reduction of the water surface.

Regarding the amphibious tractors, which remove dams and obstacles, al-Sumri states: Three tractors arrived at the lake in September 1986 and worked earnestly, but for only four weeks. After that, they stopped. One tractor broke down, and the others were rented by the Authority to fish-farm owners, because, the Authority claimed, it was important to bring in revenues!

Al-Sumri claims that the Authority is not serious about protecting the lake or regulating fishing in it. This has led production to drop to 100 tons per month, compared to 260 tons per month in the past. He further emphasizes that the proceeds of [fines for] fishing violations at the lake, which amount to at least 100,000 Egyptian pounds

per year, enter the authority's treasury, without any portion of these proceeds being spent to deal with the lake's problems.

However, Engineer Tahir Yusuf, the head of the Fish Resource Development Authority, states: Efforts have been made, and the tractors are carrying out their tasks. However, the contraction of the lake's area due to continual drainage, along with the increase in sewage has highlighted and exacerbated the effects of pollution. This places a burden on the authority, which is working to keep the gates of the straits open and clean to reduce the effectiveness of pollutants.

Yusuf calls on the Housing Ministry to cooperate with the authority and with the governorates of Port Said and Damietta to examine all methods for finally eliminating pollution.

Thus, all of the concerned parties agree that the lake represents a chemical bomb that might explode at any moment, and that the problem must be confronted. The drainage operations must stop immediately in the areas of al-Bashtir and al-Jankah. Work must also stop on the land road project from the Straits of al-Jamil to Port Said Farm. Experts believe that the opening of the straits is an urgent matter, because it will permit the salty water to purify the fresh water in the lake. Are officials moving to end the crimes of continual drainage in Lake al-Manzalah? Are they acting before the lake becomes transformed completely into a dead lake?

Germany To Fund Cement-Dust Pollution Study in Hulwan Area

91AA0445Z London *AL-SHARQ AL-AWSAT* in Arabic
14 Jun 91 p 5

[Text] Cairo—The German Government has agreed to allocate 25 million marks to conduct studies and applied experiments to end cement-dust pollution in the Hulwan area.

Engineer Faruq Budaywi, the chief of the Egyptian Environmental Affairs Agency, stated that these experiments concern two specific proposals. The first involves the collection of cement dust that ascends from cement factories by means of special filters. The collected dust is heated to vaporize the alkaline material in it and is then reconstituted as usable cement. The second proposal concerns the collection of this cement dust and its mixture with sand to produce construction bricks.

Engineer Faruq Budaywi indicated, in a seminar organized by the Arab Office for Youth and the Environment in Cairo this week, that the cement dust that ascends from the chimneys of factories amounts to seven percent to eight percent of production, and that the utilization of this dust would achieve a 10-percent production increase and would protect the environment from pollution.

The Environmental Affairs Agency is achieving these two goals by placing filters on the chimneys of cement factories in the Hulwan area. These filters, which prevent the ascent of cement dust, cost \$5 million, or 19 million Egyptian pounds. They were produced domestically and

incorporate several imported components not produced in Egypt. The technical agencies are evaluating the performance of these filters and are modifying them to suit Egypt's local conditions.

Engineer Faruq Budaywi adds that the third proposal for using the cement dust employs the semi-wet method, which involves collecting the dust, spraying water on it to clean it of impurities, and reproducing it as cement usable for all purposes. This is considered one of the least polluting cement production methods, because the percentage of cement dust that ascends into the air is low due to the use of water in production.

The Environmental Affairs Agency is currently supervising the establishment of a green belt of trees around Cairo to protect it from the dust and sand that falls on it from the mountains and surrounding desert, especially the Muqattam hills. The length of the belt being planted is 99 kms. The first part of it has been completed. It extends from the al-Fayyum desert highway eastward through the desert, crossing the Nile to the al-Ma'adi area, to continue around the circular road neighboring the al-Muqattam hills.

With its green areas and gardens, the green belt helps to eliminate suspended dust particles; these particles threaten Cairo's population with serious dangers, because facilitate the dispersal of lethal gasses, such as carbon-monoxide and carbon-dioxide, which asphyxiate persons exposed to them when their percentages in the air increase, especially in the hot summer months in crowded areas of Cairo.

Engineer Faruq Budaywi states that the Environmental Affairs Agency, in cooperation with state agencies, has established defined standards for the technical inspection of cars to protect the air from pollution caused by car exhaust. These standards prohibit the operation of cars requiring a complete or partial engine overhaul.

He pointed to another pollution problem caused by the type of motorcycles used in Egypt. These motorcycles are a major source of pollution because of the high percentages of oil added to the gas they use. He adds that the solution to this problem requires years, during which the motorcycle factory would change its production method and produce engines requiring the addition of low percentages of oil to the fuel to avoid the production of the strong pollutants that we are now seeing.

INDIA

Controversy Over Safety of Tehri Dam in Himalayas Continues

BK1907030291 Hong Kong AFP in English 0215 GMT 19 Jul 91

[By Anil Penna]

[Text] New Delhi, July 19 (AFP)—Indian conservationists are pushing the government to scrap a huge, Soviet-aided dam in the Himalayas where experts believe an earthquake with the force of 10,000 atom bombs is waiting to strike.

But they are fighting a powerful lobby of politicians, engineers and builders determined to make the three-billion-dollar Tehri Dam a reality.

N.D. Jayal, director of the Natural Heritage Cell at the Indian National Trust for Art and Cultural Heritage (INTACH), calls the project an invitation to disaster.

The dam should be built to withstand a quake strong enough to uproot and throw objects into the air, but has been hopelessly under-designed, he said.

Seismologists believe a quake with a magnitude of 8.5 on the Richter scale is almost a certainty during the lifetime of the dam. Such a quake would unleash the same energy as 10,000 Hiroshima-size bombs exploding at the same time.

The dam has been designed to withstand an earthquake of magnitude of 7.2, Mr. Jayal said, but an earthquake of 8.5 would unleash 300 times as much energy.

"Imagine you are sitting in a room where a bomb drops and maybe you are hurt or escape with injury," said Mr. Jayal, whose organisation is at the forefront of a campaign against the project.

"Then imagine a bomb 300 times as powerful drops. Then what happens? To proceed with the dam is an act of great folly. It is a total subversion of the environmental system. It would have catastrophic consequences."

Last week, Mr. Jayal sent missives urging a second look at the dam's design to practically all top government officials, from the president and the prime minister on down.

He acted after project authorities approached the Finance Ministry's public investments board for an approval that would open up the government's coffers. Project authorities and builders followed up with large newspaper advertisements extolling the "Necklace of the Himalayas."

They cited the dam's benefits, including the generation of 2,400 megawatts of electricity, the creation of irrigation facilities for 270,000 hectares (667,000 acres) of land, and the daily supply of 162 million gallons of water daily to New Delhi.

S.P. Singh, chairman of the Tehri Hydro Development Corporation, said in a statement he was confident the new Indian Government would grant approval, and vowed to complete the project by 1995.

Opponents of the dam are disheartened enough to believe the project will ultimately go through, thanks to the powerful support it enjoys from politicians and the bureaucracy.

But they have the experts on their side in the campaign against the rock and earthfill dam, located at a height of 260 metres (850 feet in the foothills of the Himalayas).

Soviet seismologist V.I. Keilis Borok, president of the International Union of Geodesy and Geophysics, and U.S. expert J.N. Brune have both testified to the hazards posed by the dam.

Moscow had encouraged New Delhi to go ahead with the project by agreeing to finance it in 1986, but Soviet experts were unanimous that the Tehri Dam required "serious reconsideration," Mr. Borok wrote in a letter to Mr. Jayal.

Mr. Brune, who paid a recent visit to India, said in an article he wrote for an INTACH publication that the dam's location was one of the most hazardous from the point of view of earthquakes.

The risk factor was "extreme," he said.

On the hazard rating scale of zero to 36 prescribed by the Paris-based Commission Internationale de Grande Barrages (International Commission on Large Dams), the Tehri Dam rates 36.

Mr. Jayal said that should an earthquake strike, the result would be a catastrophic dam-burst which would kill millions of people and wipe out the Hindu holy towns of Deoprayag, (name indistinct), Rishikesh and Hardwar, which lie downstream along the Ganges River.

Eight major earthquakes of 7.5 or stronger and many less-powerful ones have occurred along the Himalayan front over the past century, and thousands are believed to have died in a 1803 quake which devastated the Tehri Region.

"We should ask ourselves for whom is the dam is being built," said Sunderlal Bahuguna, 65, who earned world renown for his crusade in the 1970s against the felling of trees in the Himalayas.

"They talk about electricity, which will go to industries in the plains. They talk about water, which will fill the swimming pools of hotels in New Delhi. There is nothing for the people of the impoverished hills," he said in an interview here.

"In the name of development, we are committing suicide. It is against natural justice."

Mr. Bahuguna and a dedicated band of followers are going from village to village in the Tehri Region to mobilise public opinion, which conservationists believe is their only weapon.

For his efforts, dam supporters have dubbed him a "madman" and an enemy of development.

"I have got ridicule, neglect, isolation and insult for swimming against the tide," Mr. Bahuguna said. "But I have no regrets. Someone has to fight for harmony between man and nature."

IRAN

Rising Caspian Sea Threatens Iranian Coast

91AS1153Z Tehran KAYHAN INTERNATIONAL
in English 15 Jun 91 p 1

[Text] Bandar Anzali (Gilan) (Irna)—Water level of the Caspian Sea is on the rise, and according to the governor-general's office here Thursday the level had risen by 40 cms over the past two months, posing serious threat to coastal farmlands and residential areas.

In the past two days alone, the world's largest inland sea whose elongated shape stretches north to south for almost 1,200 km covering an area of 371,000 sq km, swelled by five cms, it added.

At the present, it said, 450 hectares of lush green paddy-fields around this northern Iranian port city and another 100 hectares in the coastal towns of Roudsar, Langroud, Astaneh Ashrafiyeh and Astara on the slopes of the majestic Alburz mountains are threatened by the rising water level.

Some 350 families living near the Bandar Anzali coastline are exposed to immediate danger.

The rise in the Caspian water level whose surface lies some 30 meters below ocean level, is possibly the result of more inflow from rivers emptying into the basin particularly the Volga, Ural and Terek on the northern Soviet side.

Rivers feeding the Caspian from its southern or Iranian side such as the Aras, Atrak and Talish are small and account for a mere three to four percent intake of the total fresh water supply.

Based on statistical information gathered by the Soviet Union on the fluctuation of Caspian waters since 1840, the sea level rose or dropped by 140 centimeters every 10 years between 1840-1920.

Since 1920 the average 10-year fluctuation of the sea level rose by two meters inundating part of the fine sandy beaches.

However, since 1977 the waters have been steadily on the rise with no sign of stopping or receding, sounding alarm to surrounding settlements.

Iran has taken measures to evacuate people from areas threatened by encroaching water and save quality rice fields from being submerged in salty waters.

MOROCCO

Water Projects Program To Begin in Nador Province

91WN0620A Casablanca AL BAYANE in French
27 Jun 91 p 4

[Text] The Town Infrastructure Fund (FEC) is about to finance a vast program valued at 6.5 billion centimes [65 million dirhams] to supply drinking water to several communities within the jurisdiction of Nador province's rural towns of Had Beni Chiker, Bouyefour, Kariat Arkmane, Midar, Temsaman, Tlat Azlaf, and Aroui.

The work to be undertaken in connection with this program involves both the production of drinking water and its distribution.

The Had Beni Chiker project consists of conveying water from the Ibn Ajajan spring, rebuilding the water intake system at the spring, and building a 500-cubic-meter reservoir and a 3,680-meter distribution network.

The cost of the project is estimated at about 6 million dirhams.

At Iddaden, the water supply system of the National Drinking Water Office (ONEP) will be tapped into, and a 4,500-meter water conduit will be installed. In addition, a partially buried 500-cubic-meter tank and a 6,895-meter distribution network will be built. The total cost is about 5 million dirhams.

At Jaadar, the ONEP's water supply system will be tapped into and a conduit 80 meters in length will be installed, along with a partially buried 500-cubic-meter tank and a 8,050-meter distribution network. The budget allocation for the entire project is about 3.3 million dirhams.

The town of Kariat Arkmene and its beach are the targets of a project to install a water conduit 20,700 meters in length from the ONEP's treatment plant, to build a 600-cubic-meter elevated tank and a 7,485-meter distribution network, and to replace 135 delivery pipes to households. The budget allocation for the project is about 8.5 million dirhams.

As for Midar, the work will consist in outfitting a well, laying two conduits (4,870 and 1,910 meters in length), building a partially buried 1,000-cubic-meter tank and a 12,685-meter distribution network, and replacing 570 delivery pipes to households. For the entire project, 13.5 million dirhams have been budgeted.

The Town Infrastructure Fund will also finance similar projects in Korona and Tamsaman. Project activities will consist in outfitting a well, installing a water conduit over a distance of 2,020 meters, building an elevated 500-cubic-meter tank and a 6,600-meter distribution network, and replacing 45 delivery pipes to households. The overall cost of the project is estimated at about 6 million dirhams.

The projects affecting Kasseta and Tlat Azlaf involve replacing the fittings at one well, installing a conduit over a distance of 3,295 meters, assembling the fittings already available at another well, installing a tank to protect the conduit against water hammer, building a partially buried 250-cubic-meter tank, outfitting an already existing tank, and installing two distribution networks (2,105 and 3,910 meters in length). The total cost of these two projects borders on 6.5 million dirhams.

A budget allocation of more than 15 million dirhams has been made for Aroui. Plans call for the construction of a partially buried 500-cubic-meter tank and a distribution network spanning 20 kilometers.

It should be noted that since 1987, the Town Infrastructure Fund has granted a total of some 20 billion centimes [200 million dirhams] to Nador province's towns, 50 percent of which has gone to drinking water projects, 30 percent to sanitation, and 20 percent to other infrastructure projects.

Construction Begins on Second-Largest Dam in Africa

91WN0571A Rabat *L'OPINION* in French
30 Jun 91 pp 1, 3

[Unattributed article: "Mjaara Dam: Second-Largest Dam in Africa"]

[Text] Today at 1300, His Majesty King Hassan II will preside over the ceremony marking the launching of the Mjaara dam construction, the second-largest dam in Africa after the Aswan dam (Egypt).

The Mjaara dam, sized to hold 3,800 million m³, will:

- regulate a volume of some 1,740 million m³;
- protect the Gharb plain from floods;
- optimize hydroelectric power production throughout the Sebou basin.

Considering the large water deficit that is expected to eventually affect the Bou Regreg-Oum Er Rbia hydraulic region, developing the water potential of wadi Ouergha is, in the future, the only alternative likely to yield the water volumes required to meet the increasing water needs of the region. The idea of a massive transfer of water to the region now appears to be an unavoidable necessity.

Viewed in this context, and considering its exceptional performance characteristics, the Mjaara dam is the most suitable alternative. In view of the objectives set for irrigated agriculture to ensure the country's food self-sufficiency, control over the wadi Ouergha water is indispensable to achieve the objective of irrigating 1 million of hectares. In this respect, the Mjaara project would contribute 13.5 percent in achieving the objectives of the sugar-production plan, and close to seven percent for the milk-production plan, based on the latest crop rotations contemplated for sugar and feed crops.

Detailed studies concerning the Mjaara dam have shown the advantage of optimizing the dam size to provide better irrigation conditions with acceptable shortages, and to achieve better flood control on the main tributary of wad Sebou and maximum utilization of the water mobilized to produce energy.

Thus, these studies led to adopt a reservoir size of 3,800 million m³. Such a reservoir will hold nearly 50 percent of the volumes that can be regulated by large dams in the Sebou basin as a whole.

The volumes thus regulated will serve:

- To irrigate about 100,000 hectares in the Gharb plain, a significant contribution in achieving the national objective of food self-sufficiency. Thus, in the third-installment irrigated zone alone, which is directly concerned by the Mjaara project, sugar and milk production will be multiplied by 10 to 20 and by 11 to 17, respectively, depending on how intensive agricultural development is.
- To develop a peak power output of 205 MW at the start of the project, and 130 MW in the steady stage, and to produce 390 million kWh thanks to a power plant built at the toe of the dam (240 MW).

- To protect the plain against floods, with a hydraulic efficiency better than 90 percent.

Considering the importance of the wadi Ouergha water mobilization, development schemes concerning the wadi were submitted to the Higher Water Council.

In fact, wadi Ouergha alone contributes over 50 percent of all the water from the Sebou basin. The advantage of developing this water potential was demonstrated already in the sixties, in connection with studies undertaken for the Sebou project.

Note, however, that the schemes considered must be consistent with the overall objectives set for the development of the Sebou basin as a whole, concerning water-supply regulation to meet drinking and agricultural water needs, protection of the Gharb plain against floods, and electric power production.

Two different Ouergha development projects were considered in order to achieve the objectives set, while including completed or planned developments in the Sebou basin:

- The Mjaara dam with a reservoir of 3,800 million m³.
- All the dams built on the wadi Ouergha or its tributaries, at the following sites: Bab Ouender, Pont de Sker, Rhafsa, Tafroud.

The Mjaara site is the only one to have a large storage capacity. Because of its privileged situation downstream from the Ouergha basin, it allows nearly total control of the water flow. As far as irrigation is concerned, the Mjaara dam will provide the 1,100 million m³ per year required for the 100,000 hectares of the third-installment Gharb irrigation zone.

However, the upstream dam complex will provide only 65 percent of the Mjaara dam capabilities. As far as protection against flood is concerned, thanks to its large size, the Mjaara dam will both guarantee a regulated water supply and reserve a capacity of over 1 billion m³ for flood control. Thus, thanks to flood reduction and the appreciable decrease of overflow volumes, the hydraulic efficiency of the protection provided will exceed 90 percent.

On the other hand, the total capacity that could be offered by the upstream dam complex is low compared with that of Mjaara; for the same water level, it will not achieve the two objectives of regulated water mobilization and effective flood protection for the Gharb plain.

As far as hydroelectric power production is concerned, the Mjaara dam is of undeniable interest because of the possibility of adding to it a power plant with an installed capacity of 240 MW, translating into a mean power capacity of 390 kWh and a guaranteed power output of 205 MW, whereas all the power plants that could be added to upstream dams add up to a total installed capacity of 70.6 MW and a production of only 169 million kWh, with no guaranteed power output.

As far as a possible transfer to the South is concerned, besides making a decisive contribution to the development of the Gharb region, the Mjaara dam is the only

possible development project that could reserve an average volume of at least 600 million m³ for transfer to the South, thanks to the considerable Ouergha resources and the interesting features of the site. This major asset will confer special importance to the Mjaara dam as a project of national interest.

SRI LANKA

Coastal Belt Coral Reefs Threatened

BK2807121291 Colombo Sri Lanka Broadcasting Corporation International Service in English 1045 GMT 28 Jul 91

[Text] The internationally-famous coral reefs in the northwest, northeast, and southern coastal belt of Sri Lanka are rapidly reaching destruction. Environmental sources told LANKAPUVATH that the burning of reef to supply raw material for construction work, using dynamite for fishing purposes, catching some of the beautiful fish alive that are found near reef, careless rowing and chips of coral being taken away by tourists as mementos, dropping garbage near the reef by some of the tourist hotels are some of the causes that led to the destruction of the coral reef. The coral reef at Hikkaduwa on the southern coast has already been turned into a sterile zone. It is the bounden duty of every citizen to protect these reefs that are internationally famous.

TUNISIA

Progress in Sanitation, Water Purification Projects Detailed

91WN0588A Tunis LA PRESSE DE TUNISIE in French 6 May 91 p 4

[Text] When the 11-City Project is completed, nearly all the northern region's sanitation problems will be eliminated. Eleven waste water treatment stations are to be built in the cities that discharge waste water either directly into the Medjerda River or its tributaries.

Our country recently hosted the conference of ministers of the environment from the French-speaking countries. There could be no better indication of the trust placed in our country as a land that protects the environment than the fact that Tunis was chosen as the site for an event of this magnitude. It also attests to the progress achieved in protecting the environment in more than one domain—agriculture, sanitation, etc. This article will focus on just one of those fields: sanitation and water purification.

Without claiming perfection, our country has managed in a few short years to build a sanitation infrastructure of which we can be proud. The standards achieved by the ONAS [National Public Sanitation Office] and the advanced techniques it uses are rather impressive for a developing country. Nowadays, many African countries request Tunisia's assistance through the ONAS in training their managerial staff in this area. The remarkable distance we have traveled is a good illustration of

our people's determination to preserve their environment. To understand how far we have come, we need to look back in time....

It all began in 1974 when cases of cholera were detected in the cities of Sfax, Kairouan, and Kelibia. Deplorable sanitary conditions were at the root of the epidemic, which immediately gave rise to panic. In order to halt the epidemic and stave off a worst-case scenario, it was necessary to reexamine the way in which the urban sanitation sector was managed and reduce, if not neutralize, the harmful effects of waste water.

As a result, the ONAS was established by Law 74-73, dated 3 August 1974. It is a public establishment of a commercial and industrial nature, formed under civil law and endowed with financial autonomy.

Prior to that, sanitation management was scattered among various ministries and departments. The techniques in use at that time were not highly developed. Municipalities were responsible for operating, maintaining, and expanding the few sanitation networks.

In addition, the Ministry of Infrastructure's Office of Urban Water Resources had the role of planning and carrying out projects. SONEDE [National Water Exploitation and Distribution Company] was responsible for operating and maintaining several sanitation works.

We have come a long way since then. The projects that have been completed are numerous. Our discussion here is limited to the major undertakings of a national or international dimension.

The Lake of Tunis was the focus of a large-scale project. It was necessary to clean up the lake, re-routing the waste water dumped into it so as to eliminate once and for all the problem of foul odors that plagued the towns along its shore, particularly in the summer months.

Top priority was given to the coastal regions, the concern being to preserve our beaches and thereby provide a untroubled setting worthy of our country's tourism landscape.

Several projects were carried out in the interior of the country: the 17-city project, followed by the 30-city project.

The work of the ONAS is performed in three stages: In the first phase, a sewage collection system must be set up by installing primary and secondary sewers. In the second, waste water must be treated before being released. The third phase—to which the government attaches a great deal of interest—consists in reusing purified waste water in the areas of agriculture, tourism, and industry. On this subject, the instructions of the president of the republic are clear: Purified waste water is a resource that must be managed well, particularly in view of the insufficient levels of rainfall in recent years.

The ONAS currently operates 26 water treatment plants. Together, they purify a total of 100 million cubic meters a year, equivalent to the volume of water in the reservoirs of three medium-sized dams.

The quality of this water is superior to international standards that limit the 5-day biological oxygen demand (BOD-5) of a treatment plant's effluent to 30 milligrams per liter. The treated waste water released from plants operated by the ONAS has a BOD-5 of 10 to 20 milligrams per liter.

There are plans to use treated waste water at golf courses in Hammamet, Sousse-Nord, and Monastir. Additional quantities of water are available to irrigate animal feed crops and tree farms in Kairouan, Gafsa, Sfax, etc.

Thus far, the ONAS has completed 240 million dinars worth of work as part of its major projects. In the cities under the ONAS' stewardship, the percentage of buildings hooked up to the sanitation system can be as high as 90 percent.

Across the country, 168 water pumping stations have been built, for a total of 4,000 km of pipes laid by the ONAS as part of the collective sanitation effort.

The Waters of the North: A Resource To Be Preserved

The Medjerda River is an important source of water and a fair amount of our farming is heavily dependent upon it. If it is not already the case, the Medjerda—and the reservoir of the Sidi Salem dam along with it—could become seriously contaminated by the waste water discharged into it the entire length of its course, making it extremely advisable, even imperative, that it be protected. That, precisely, is the ONAS' latest plan.

It is a vast undertaking that will affect most of the cities in the northwest. From the country's interior and coastal regions, the focus has now shifted to the north. Nearly all the sanitation problems in the north will be eliminated once the project is completed.

This mammoth undertaking, which has been named the "11-city project," consists in building 11 waste water treatment plants in the cities that discharge waste water directly into the Medjerda or into one of its tributaries. Those cities include Jendouba, Beja, Medjez El Bab, Bousalem, etc.

The first stage, which centers on the cities of Jendouba, Beja, and Medjez El Bab, began some time ago. Three waste water treatment plants, several pumping stations, a regional laboratory, a maintenance facility in Beja, and other facilities, will be built to serve these cities. The three treatment stations will process a combined total of 9.5 cubic meters of waste water, enough to irrigate an area of 923 hectares.

Because Tunisia is a semi-arid country, purified waste water is exactly what is needed in order to relieve—however slightly—its fairly pronounced scarcity of rainfall and make useful those lands that were under exploited or abandoned due to a lack of water.

These activities are partially financed by KFW (Kreditanstalt Fur Wiederaufbau).

The second phase of the project will involve the cities of Bousalem, Teboursouk, Siliana, Tebourba, and Jedeida.

NEAR EAST/SOUTH ASIA

In addition to this project, as part of the effort to protect the reservoir at the Sidi Salem dam and with the goal of protecting the environment, the ONAS—with financial and technical cooperation from West Germany—has conducted a study of general plans for the collection and treatment of household solid waste in the 11 largest cities in the Medjerda watershed. In most cities, household waste is still dumped into water courses and eventually flow into reservoirs at dam sites.

The ONAS has proposed a plan of action to achieve the goals established in the urgent action phase on which the success of the ongoing efforts in urban sanitation and waste water treatment depends.

There are three main thrusts to the plan:

- to improve or install operational collection systems;
- to halt the indiscriminate dumping of solid waste, particularly in river beds; and
- to install supervised landfills and ensure that household solid waste is properly disposed of.

Conference Held on Protecting Gulf of Gabes Marine Resources

91WN0588B Tunis LA PRESSE DE TUNISIE
in French 15 May 91 p 3

[Article by Rafik Benzina: "Crisis in the Gulf of Gabes"]
[Text] A representative cross-section of the country turned its attention to the problems affecting the Gulf of Gabes: the discharge of chemical wastes, abusive trawling practices, over exploitation of an already ailing Mediterranean Sea, etc. Our ecologists have taken up the cause.

The Association for the Protection of Nature and the Environment (APNES) recently organized a seminar on the: "Protection of the Marine Resources of the Gulf of Gabes," in cooperation with the Friederich Nauman Foundation.

Mr. Mouldi Zouaoui, minister of agriculture, opened this important ecological event at which the region's governor, Mr. Mohamed Ben Saad, and many national and regional officials were also present.

Following the customary welcoming speeches, which were given by Mr. Ahmed Zghal (president of APNES) and Mr. Horst Schauer-Koeller (a representative of the Friederich Nauman Foundation), the minister of agriculture spoke of the importance of the seminar's theme and the fortunate coincidence between this meeting and a conference on marine resources recently chaired by the head of state on the subject of the preservation of our maritime resources and the advancement of the fishing sector.

Mr. Zouaoui reminded listeners of the Gulf of Gabes' important contribution to the fishing sector: 60 percent of the national catch (70 percent in terms of value). The minister pointed out, however, that production has been declining for several years (from 47,000 metric tons in 1988 to 39,000 in 1990), while at the same time, the fishing fleet has continued to expand. "For this reason,

the necessary measures should be taken to protect this important repository of national wealth." Overexploitation (often including illegal practices) and the polluting of "Gulf waters threaten to deprive us of this wealth in the medium term. The state has therefore taken certain decisions, with others to follow. One is to ban the discharge of chemicals into the sea. Among the commissions that will prepare the eighth five-year plan, a commission for the protection of nature and the environment has been formed, the first since independence."

"In addition the state will help ease ship congestion in the Gulf of Gabes by encouraging the fishing fleet to spread out along the country's coast (particularly in the north) and by fostering catches of certain varieties of fish with a high nutritional value such as the 'blue fish.' On the other hand, the state will not hesitate to take severe action in the event of violations of the fishing regulations."

The opening session was followed by three presentations made by specialists.

The first was given by Mr. Mohamed Nejmeddine Brady, a research associate at INSTOP [National Scientific and Technical Institute of Oceanography and Fishing] (Sfax branch), who spoke of "the present situation in the Mediterranean and the exploitation of the Gulf of Gabes." In his presentation, Mr. Brady concurred with the observation made by Commandant Cousteau who recently stated that "the Mediterranean is suffering from a serious and deep wound." According to Mr. Brady, several factors have combined to bring about this critical situation:

- The "aquatic balance" has been disrupted by the fact that the influx of freshwater from rain and rivers is insufficient to replenish what is lost through evaporation.
- The influx of salt water from the Atlantic via the Strait of Gibraltar and the high rate of freshwater evaporation make the Mediterranean Sea high in salt content (from 35.37 per thousand to 35.39 per thousand). Moreover, mineral salts are lost through the Strait of Gibraltar and are not replenished. This has an impoverishing effect on the Mediterranean, which is experiencing a decline in plankton levels.
- The situation has been made worse by human activity:

—The opening of the Suez Canal in 1869, while contributing greatly to the development of world trade, caused disruptions of a hydrological and biological nature in the Mediterranean.

—The use of river water has greatly reduced the flow of freshwater into the Mediterranean. (For example, in 1962 the Nile carried 62 cubic km of water to the Mediterranean; as of 1970 that level had dropped to 4 cubic km.)

—Overfishing, pollution, and the development of the Mediterranean's shores into tourist areas also contributed considerably to its deterioration.

Speaking more specifically of the Gulf of Gabes, Mr. Brady decried the overfishing taking place there. "Because of overexploitation, a marked drop has been observed in fish catches." "The trawlers caught 70 metric tons in 1984 but only 45 metric tons in 1989. Moreover, the discharge of chemicals and pollutants, haphazard fishing practices, and the destruction of marine plant life are largely responsible for upsetting the ecological balance of the Gulf of Gabes, which is ailing and must be given energetic care...and protected."

Pessimism Among the Specialists

The second and third presentations of the morning session were more technical, as their themes will indicate. Mr. Sadok Ben Meriem (research associate at INSTOP in La Goulette) spoke of "the strategy for exploiting ichthyological resources." Using diagrams and graphics, Mr. Ben Meriem presented and explained certain fundamental factors that would make it possible to tap the sea's resources in an optimal manner without seriously endangering its "potential" or, as it is known to scientists, "the total biomass of its life forms." He also spoke of options to ensure sustainable maximum catches.

Mrs. Asma Hamza (a fisheries engineer at INSTOP, Sfax branch) spoke of the "Meadows of Posidonia in the Gulf of Gabes." She called the listeners' attention to the importance of Posidonia—a variety of seaweed that plays a very important role in underwater life—and to

the phenomenon of shrinking "meadows" observed in the Gulf of Gabes since 1965.

Three more presentations were given that afternoon: the first by Mr. El Abed (a professor at ENIS [not further identified] on the subject of the "effects of pollutants on marine organisms;" the second by Mr. Ben Moussa (researcher at the National Institute of Remote-Sensing) on the "use of remote-sensing to study pollution in the Gulf of Gabes;" and the third by Mr. Jebnouni (a lawyer in Sfax) on "maritime legislation."

In the general discussion that preceded the close of the seminar, the organizers drew up a list of recommendations, which include:

- strict enforcement of the regulations governing fishing;
- the monitoring of pollutants and the protection of the gulf (as well as the sea, in general) from all sources of pollution;
- a ban on certain practices destructive to marine plant life;
- the establishment of direct exchanges between fishermen, on the one hand, and scientists and researchers on the other, so that the fishing community may benefit from the knowledge and experiments of the scientific community; and
- the encouragement of specialized scientific research so that we may keep accurate scientific data on conditions in this sector.

It is to be hoped that all the parties involved will view these "recommendations" as nothing short of imperative.

German Economics Institute Report on USSR Environmental Problems

*91WN0526A Berlin WOCHENBERICHT-DIW
in German 16 May 91 pp 267-276*

[Report of the German Institute for Economic Research, No. 20, 1991, Berlin, 16 May 1991: "Environmental Problems in the Soviet Union and Possibilities for International Cooperation toward their Solution"]

[Text] Environmental protection is of increasing importance for relations between the West and the countries of Eastern Europe. Cooperation possibilities have improved since the end of the communist power monopoly and the introduction of market economy reforms. Simultaneously, the insight has grown that global climate protection and the transborder environmental problems in Europe require a reduction of environmental stress in the east of the continent. This applies in particular to the Soviet Union where, with 17 million tons, as much SO_2 is emitted as in all of the EC countries combined. In 1989, only 25 percent of all waste water requiring purification was cleaned up in accordance with Soviet environmental regulations. Toxic waste is often stored only at totally unsecured dumps. The numerous nuclear installations present great environmental danger. Investment and structural policies above all are responsible for the critical environmental situation. Replacement investments are chronically neglected, and the excessively long use of production capacities has resulted in great obsolescence of capital assets. The energy and metal industries are of very great importance in the investment structure. By contrast, little is done to lower the consumption of raw materials and energy. Hence, the ecological crisis in the Soviet Union cannot be solved by belated environmental protection, but only through structural change and fundamental modernization of industry. Promotion of this modernization process should be the focal point of cooperation with the West. Important areas of cooperation could be measures for saving raw materials and energy, increased reactor safety, and conversion of the Soviet armaments industry to the production of environmental technology.

Air Pollution

The sum total of statistically recorded pollutant emissions is listed as 94 million tons for 1989; 58.5 million tons come from industry, and 35.5 million tons from road traffic (Table 1). Not recorded are the emissions from rail, air, and ship traffic, nor are emissions caused by agriculture and the army, domestic [fuel] burning and incineration of garbage. They are estimated at a total of 20 to 30 million tons.

Industrial emissions are essentially due to five harmful substances (in million tons): suspended matter: 13.7; sulphur dioxide (SO_2): 16.8; carbon monoxide (CO): 14.0; nitrogen oxides (NO_x): 4.5; hydrocarbons (C_xH_x): 8.4.¹ (Table 1) Traffic emissions consist of 28 million tons of CO , 1.8 million tons of NO_x , and 5.7 million tons of C_xH_x .

One-third of the suspended matter is emitted by power plants, 15 percent by the iron and steel industry, 10 percent by the construction materials industry, and 5 percent by the nonferrous metal industry. Power plants have a share of over 40 percent in sulphur dioxide, the nonferrous metal industry 25 percent, and the iron and steel industry 6 percent. The most important industrial discharger of carbon monoxide is the iron and steel industry with 45 percent, followed by the petroleum industry (7 percent). Sixty percent of nitrogen oxide emissions by industry are due to power plants, 10 percent from the iron and steel industry. Hydrocarbon emissions are concentrated in three industrial sectors, namely, the petroleum industry with a share of 50 percent, petroleum processing and petrochemicals with 25 percent, and the natural gas industry with not quite 20 percent. (Table 2)

Industrial emissions are very unevenly distributed by regions. Over half of all emissions in 1988 occurred in only five industrial regions: in the Ural, the Donets-Dnieper region, western Siberia, Kazakhstan, and eastern Siberia (Table 3). Extremely high emissions occurred in some locations of the iron and steel industry, the nonferrous metal industry, and large coal-burning power plants. The nonferrous combine of Norilsk (eastern Siberia) emitted 2.4 million tons of harmful substances in 1988; of these, 2.2 million tons alone were SO_2 . Large steel combines are primarily responsible for the amount of pollutant emissions in Krivoj Rog (1.3 million tons), Magnitogorsk (874,000 tons), Mariupol (814,000 tons), Temirtau (937,000 tons), Novokusnetsk (889,000 tons), Lipetsk (745,000 tons), Cherepovets (669,000 tons), and Nizhniy Tagil (663,000 tons). In these cities, more than half of the emissions are carbon monoxide. Ninety-seven percent of the pollutant emissions in Ekipastuz (765,000 tons) come from power plants. Here, emissions of flue ash are frighteningly high (490,000 tons).² (Table 4)

The degree of retention of pollutants is very low in Soviet industry. In the case of suspended matter, almost the entire amount of pollutants is trapped in filters. By contrast, the amount is only 19 percent for SO_2 , 39 percent for CO , 11 percent for NO_x , and 27 percent for hydrocarbons. The percentage of pollutants retained is highest in the fertilizer and construction materials industries (93 percent, respectively), and lowest in the natural gas and petroleum industries (3 percent and 6.5 percent, respectively).³

Table 1. Pollutant Emissions Into the Air in the USSR (in millions of tons)

	1980	1985	1986	1987	1988	1989
All harmful substances	110.8	105.0	103.6	100.5	97.5	94.0
—Stationary sources	72.8	68.3	66.5	64.3	61.7	58.5
—Traffic	38.0	36.7	37.1	36.2	35.8	35.5
Suspended matter	15.8	16.6	16.2	15.4	14.7	13.7
Sulphur dioxide	19.9	19.6	18.7	18.6	17.7	16.8
Carbon monoxide	48.4	44.2	44.5	44.6	43.2 ³	42.0 ³
—Stationary sources	18.4 ²	15.2 ²	15.3	15.4	14.9	14.0
—Traffic	30.0 ¹	29.0 ¹	29.2 ²	29.3 ²	28.3 ¹	28.0 ¹
Nitrogen oxides	5.5	5.7	6.1	6.2	6.3 ³	6.3 ³
—Stationary sources	3.6 ²	4.0	4.3	4.5	4.5	4.5
—Traffic	1.9 ¹	1.8 ¹	1.9 ¹	1.8	1.8 ¹	1.8 ¹
Hydrocarbons	15.2	14.8	15.2	14.8	14.2 ³	14.1 ³
—Stationary sources	9.1 ²	8.9 ²	9.0	8.4	8.5	8.4
—Traffic	6.1 ¹	5.9 ¹	5.9 ¹	5.8	5.7 ¹	5.7 ¹

Other Pollutants From Stationary Sources (in thousands of tons)

Hydrogen sulphide		116.0	107.6	99.2	90
Carbon bisulphide		89.9	82.2	77.0	70
Fluoric compounds		29.6	27.8	25.9	25.4
Fluorides		21.2	21.0	19.5	—
Chlorine		7.6	6.9	5.2	4.8
Lead	13.0	10.0	10.0	8.7	7.9
Ammonia		104.5	91.3	89.1	—
Sulphuric acid		36.4	33.0	61.8	58.1
Acetone		12.8	13.6	13.5	—
Xylool		11.2	12.9	10.8	—
Toluol		5.2	5.8	6.0	—
Phenol		7.3	7.5	8.0	—
Hydrogen chloride		6.5	5.6	5.6	—
Hydrochloric acid			5		
Formaldehyde		3.2	5.0	4.9	—
Methanol		2.9	2.9	2.8	—
Methylic mercaptan		1.6	2.2	2.3	—
		In tons			
Mercury		47	43	46.0	45
Benzpyrene					32

¹Computed from the total of traffic emissions and the emission structure in 1987.

²Determined as the difference.

³Addition.

Sources: ENERGY: ECONOMICS, TECHNOLOGY, AND ECOLOGY, No 3/1990 p 39ff; *The Condition of the Environment in the USSR in 1988*, Moscow, 1989, p 64ff.; *The State of the Environment and Conservation Activities in the USSR in 1989*, Moscow, 1990, p 12; *Preservation of the Environment and the Rational Use of Environmental Resources in the USSR*, Moscow, 1989, p 83ff; *Ecological Problems in the Field of Energy*, Novosibirsk, 1989, p 26; *Toxic Waste Emissions in 1988*, Leningrad, 1989, p 172ff, and computations by DIW.

Table 2. Industrial Pollutant Emissions Into the Air by Sources (in million tons per year)

Enterprises Under Central Ministries for Industry	1986	1987	1988	1989	1986	1987	1988	1986	1987	1988	1986	1987	1988	1986	1987	1988	1986	1987	1988
	Total				Suspended Matter			SO ₂			CO			NO _x			C _x H _x		
Energy-producing industry	17.4	16.5	15.4	14.5	6.2	5.5	4.9	8.4	8.1	7.5	0.2	0.4	0.2	2.5	2.6	2.7	0.0	0.0	0.0
Iron and steel industry	11.3	10.9	10.4	15.3	2.4	2.2	2.0	1.2	1.1	1.1	7.1	7.0	6.7	0.5	0.4	0.5	0.0	0.0	0.0
Nonferrous metal industry	6.3	6.1	5.9		0.8	0.7	0.8	4.6	4.7	4.5	0.7	0.6	0.5	0.1	0.1	0.1	0.0	0.0	0.0
Petroleum industry	4.8	5.7	5.6	5.2	—	0.3	0.2	—	0.1	0.1	0.3	0.9	1.0	—	0.1	0.1	4.4	4.2	4.1
Petroleum processing and petrochemicals	4.3	4.0	3.7	4.2	0.1	0.1	0.1	0.6	0.6	0.5	0.8	0.7	0.7	0.1	—	—	2.6	2.5	2.2
Chemical industry	0.9	0.9	0.9		0.1	0.1	0.1	0.1	0.1	0.3	0.3	0.3	0.3	0.0	0.0	0.0	0.1	0.1	0.1
Natural gas industry	2.4	2.4	2.7	2.6	0.0	0.0	0.0	0.3	0.4	0.5	0.6	0.6	0.6	0.2	0.3	0.2	1.3	1.1	1.4
Construction materials industry	3.3	3.1	2.1	2.1	2.0	1.8	1.3	0.4	0.4	0.3	0.7	0.7	0.4	0.1	0.1	0.1	0.0	0.0	0.0
Food processing industry	—	—	1.7	—	—	—	0.5	—	—	0.6	—	—	0.4	—	—	0.1	—	—	0.0
Coal industry	1.6	1.5	1.4	—	0.4	0.4	0.4	0.4	0.4	0.4	0.7	0.7	0.6	0.0	0.0	0.0	0.0	0.0	0.0
Wood processing, cellulose, paper	1.5	1.5	1.4	1.3	0.6	0.5	0.5	0.4	0.3	0.3	0.4	0.4	0.4	0.1	0.1	0.1	0.1	0.1	0.1
Fertilizer industry	0.7	0.7	0.6	0.6	0.2	0.2	0.1	0.2	0.2	0.2	0.2	0.1	0.1	0.1	0.1	0.1	0.0	0.0	0.0
Pharmaceutical industry	0.2	0.2	0.2	0.2	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Engineering industry	—	1.5	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Industry total	65.4	64.3	61.6	58.5	16.5	15.7	14.7	18.7	18.6	17.7	15.3	15.4	14.9	4.3	4.5	4.5	9.0	8.4	8.5

Sources: *Toxic Waste Emissions in 1988*, Leningrad, 1989, p 182ff.; *The State of the Environment and Conservation Activities in the USSR in 1989*, Moscow, 1990, p 13.

Table 3. Industrial Pollutant Emissions Into the Air by Soviet Republics and Regions (in million tons per year)

	1986	1987	1988	1986	1987	1988	1986	1987	1988	1986	1987	1988	1986	1987	1988	1986	1987	1988
	Total			Suspended matter			SO ₂			CO			NO _x			C _x H _x		
RSFSR	39.3	39.4	38.1	8.8	8.7	8.4	11.2	11.1	10.5	8.8	9.2	8.9	2.8	2.9	2.8	7.0	7.6	6.8
—North Rayon	3.2	3.5	3.5	0.7	0.7	0.7	1.2	1.2	1.1	0.8	0.8	0.8	0.1	0.1	0.1	0.3	0.6	0.7
—Northwest Rayon	1.0	1.0	0.9	0.3	0.3	0.3	0.3	0.4	0.3	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
—Central region	4.1	3.9	3.6	1.1	1.0	1.1	1.3	1.2	1.1	0.8	0.7	0.7	0.4	0.4	0.4	0.4	0.4	0.4
—Volga-Vyatsky region	1.1	1.1	1.2	0.3	0.3	0.3	0.4	0.3	0.3	0.2	0.2	0.2	0.1	0.1	0.1	0.2	0.2	0.1
—Central Chernozem region	1.5	1.4	1.4	0.4	0.3	0.3	0.2	0.2	0.2	0.7	0.7	0.7	0.1	0.1	0.1	0.1	0.1	0.1
—Volga region	3.0	2.8	2.9	0.4	0.4	0.3	0.7	0.7	0.7	0.5	0.5	0.5	0.3	0.3	0.3	1.1	1.0	0.9
—North Caucasus	1.9	1.9	1.8	0.3	0.3	0.3	0.5	0.5	0.4	0.3	0.3	0.3	0.1	0.1	0.1	0.6	0.6	0.6
—Ural	9.0	9.0	8.6	2.3	2.3	2.2	2.6	2.6	2.3	2.4	2.5	2.4	0.7	0.7	0.7	0.9	0.8	0.8
—West Siberia	7.2	7.6	7.4	1.2	1.3	1.2	0.7	0.8	0.7	1.6	2.0	2.0	0.5	0.6	0.6	3.1	2.8	2.8
—East Siberia	5.0	5.0	4.7	1.1	1.0	0.9	2.9	2.9	2.8	0.7	0.7	0.6	0.2	0.2	0.2	0.2	0.2	0.2
—Far East region	2.1	2.0	1.9	0.8	0.9	0.8	0.4	0.4	0.4	0.6	0.5	0.4	0.1	0.1	0.1	0.1	0.1	0.1
Ukraine	11.9	11.5	11.0	2.6	2.6	2.3	3.4	3.3	3.2	4.3	4.1	3.9	0.8	0.8	0.8	0.6	0.6	0.5
—Donets-Dnieper region	8.8	8.4	8.0	1.9	1.9	1.7	2.4	2.2	2.2	3.5	3.3	3.2	0.6	0.6	0.6	0.3	0.3	0.3
—Southwest region	2.1	2.3	2.1	0.5	0.5	0.4	0.8	0.9	0.8	0.4	0.4	0.3	0.2	0.2	0.2	0.3	0.3	0.2
—South region	1.0	0.9	0.8	0.2	0.2	0.2	0.2	0.2	0.2	0.5	0.4	0.4	0.0	0.0	0.0	0.1	0.1	0.1
Baltic republics	1.4	1.4	1.3	0.4	0.4	0.4	0.6	0.6	0.5	0.2	0.2	0.2	0.1	0.1	0.1	0.1	0.1	0.1
—Lithuania	0.5	0.5	0.5	0.1	0.1	0.0	0.2	0.2	0.2	0.1	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0
—Latvia	0.2	0.2	0.2	0.1	0.0	0.0	0.1	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
—Estonia	0.6	0.6	0.6	0.3	0.3	0.3	0.2	0.2	0.2	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Transcaucasus	1.7	1.6	1.5	0.5	0.5	0.4	0.4	0.4	0.3	0.3	0.3	0.3	0.1	0.1	0.1	0.4	0.4	0.3
—Georgia	0.5	0.5	0.5	0.2	0.2	0.1	0.1	0.1	0.1	0.2	0.2	0.2	0.0	0.0	0.0	0.0	0.0	0.0
—Azerbaiadzhhan	0.9	0.9	0.8	0.3	0.2	0.2	0.2	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.3	0.3	0.3
—Armenia	0.3	0.2	0.2	0.1	0.1	0.0	0.1	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Central Asia	2.5	2.3	2.2	0.6	0.6	0.5	0.6	0.7	0.6	0.4	0.3	0.3	0.2	0.2	0.2	0.6	0.5	0.6
—Uzbekistan	1.5	1.4	1.3	0.4	0.4	0.3	0.5	0.6	0.5	0.2	0.2	0.2	0.1	0.1	0.1	0.0	0.1	0.2
—Kyrgyzstan	0.2	0.2	0.2	0.1	0.1	0.1	0.1	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
—Tajikistan	0.1	0.2	0.1	0.1	0.1	0.0	0.0	0.0	0.0	0.1	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0
—Turkmenistan	0.6	0.6	0.6	0.1	0.1	0.1	0.0	0.0	0.0	0.1	0.1	0.1	0.0	0.0	0.0	0.4	0.4	0.3
Kazakhstan	6.1	5.5	5.3	3.0	2.4	2.2	1.6	1.6	1.6	1.0	1.0	1.0	0.2	0.2	0.3	0.3	0.3	0.2
Belorussia	1.4	1.4	1.3	0.2	0.2	0.2	0.7	0.7	0.6	0.3	0.2	0.2	0.1	0.1	0.1	0.1	0.1	0.2
Moldavia	0.5	0.5	0.5	0.1	0.1	0.1	0.3	0.3	0.3	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0

Source: *Toxic Waste Emissions in 1988*, Leningrad, 1989, p 182 ff.

Table 4. Pollutant Emissions of More Than 200,00 Tons in Individual Soviet Cities in 1988 (in 1,000 tons)

City	Republic/Region	Total Pollutants	Of these: Suspended Matter	SO ₂	CO	NO _x	C _x H _x	Others
USSR, total		97,516						
Norilsk	RFSR/East Siberia	2,368.1	32.8	2,233.3	37.8	18.4	3.8	31.0
Krivoj Rog	Ukraine/Donets-Dnieper	1,328.2	207.9	98.1	960.3	41.2	16.2	4.5
Moscow	RFSR/Central region	1,113.1	29.8	70.6	661.5	140.3	186.0	24.9
Temirtau	Kazakhstan	936.6	260.6	117.0	514.8	34.5	6.7	3.0
Novokuznetsk	RFSR/West Siberia	888.8	136.0	90.3	605.1	37.2	11.1	9.1
Magnitogorsk	RFSR/Ural	873.7	170.2	83.9	567.2	35.8	9.8	6.8
Mariupol	Ukraine/Donets-Dnieper	813.9	112.9	54.1	602.1	32.4	7.9	4.5
Ekibastuz	Kazakhstan	765.3	490.3	171.4	18.2	81.8	3.6	0.0
Lipetsk	RSFSR/Central Chernozem region	745.3	56.3	55.4	588.7	29.2	12.4	3.3
Baku	Azerbaijan	718.9	162.8	18.0	275.2	44.6	215.3	3.0
Cherepovets	RFSR/North region	668.7	86.5	52.2	472.7	37.3	10.1	9.6
Nizhniy Tagil	RFSR/Ural	662.5	150.9	64.8	403.6	30.4	9.9	2.9
Omsk	RFSR/West Siberia	613.2	104.4	184.1	161.3	44.4	110.7	8.3
Leningrad	RFSR/Northwest region	608.3	46.1	73.6	332.1	67.8	76.9	11.8
Asbest	RFSR/Ural	538.2	252.9	175.2	14.3	92.4	3.4	0.0
Chelyabinsk	RFSR/Ural	521.0	93.6	60.1	279.3	34.5	50.8	2.7
Troitsk	RFSR/Ural	495.1	320.8	139.8	4.5	29.1	0.8	0.1
Angarsk	RFSR/East Siberia	482.1	124.7	138.5	75.8	30.3	109.4	3.4
Tashkent	Uzbekistan	453.7	14.7	30.9	296.2	56.1	55.2	0.2
Ufa	Ural-Bashkir	415.2	9.2	72.3	121.6	30.6	177.4	4.1
Dnepropetrovsk	Ukraine/Donets-Dnieper	401.3	72.6	110.8	143.5	46.5	26.1	1.8
Zaporozhyia	Ukraine/Donets-Dnieper	371.8	69.7	25.2	228.9	19.6	22.9	5.5
Krasnoyarsk	RFSR/East Siberia	366.2	78.3	39.0	198.6	18.4	22.5	9.4
Debaltsevo	Ukraine/Donets-Dnieper	356.8	70.7	240.9	2.9	41.8	0.5	0.0
Pavlodar	Kazakhstan	356.3	112.4	101.7	81.7	25.6	33.6	1.3
Kerch	Ukraine/Crimea	349.8	25.4	30.7	285.9	4.0	3.4	0.4
Volgograd	RFSR/Volga region	343.9	41.8	37.6	151.2	24.8	80.3	8.2

Table 4. Pollutant Emissions of More Than 200,00 Tons in Individual Soviet Cities in 1988 (in 1,000 tons) (Continued)

City	Republic/Region	Total Pollutants	Of these: Suspended Matter	SO ₂	CO	NO _x	C _x H _x	Others
Novosibirsk	RFSFR/West Siberia	343.8	81.2	74.8	123.4	37.9	24.4	2.1
Groznyy	RFSFR/North Caucasus	342.5	3.2	38.3	81.3	16.3	197.2	6.2
Makeyevka	Ukraine/Donets-Dnieper	338.2	56.0	25.3	237.1	7.4	6.9	5.5
Dneprodzerzhinsk	Ukraine/Donets-Dnieper	336.5	52.8	46.5	200.9	23.6	7.3	5.4
Balkhash	Kazakhstan	334.0	28.3	289.2	8.0	1.1	5.5	1.9
Tbilisi	Georgia	324.7	7.2	4.6	247.1	22.3	39.5	4.0
Orsk	RFSFR/Ural	317.0	52.0	180.5	28.0	10.4	43.0	3.1
Kiev	Ukraine	314.8	12.3	19.2	199.5	33.8	47.5	2.5
Yermak	Kazakhstan	307.1	147.6	116.1	11.1	31.1	1.1	0.1
Donetsk	Ukraine/Donets-Dnieper	305.3	21.7	31.6	209.4	14.0	22.9	5.7
Narva	Estonia	289.0	137.2	123.4	12.8	12.9	2.6	0.1
Novokuybyshevsk	RFSFR/Volga region	285.5	2.2	53.6	53.3	21.4	150.1	4.9
Yaroslavl	RFSFR/Central region	285.2	22.0	37.9	104.6	18.3	97.3	5.1
Gorki	Volga-Vyatsky region	279.6	25.7	57.1	136.2	23.1	33.4	4.1
Perm	RFSFR/Ural	271.9	12.9	39.0	87.6	31.2	91.3	9.9
Kuybyshev	RFSFR/Volga region	269.5	16.5	39.2	126.7	23.3	60.7	3.1
Novocherkassk	RFSFR/North Caucasus	267.1	85.3	125.2	30.7	20.7	4.2	1.0
Barnaul	RFSFR/West Siberia	263.9	58.2	51.4	102.9	24.0	17.4	10.0
Suvorov	RFSFR/Central region	261.0	160.5	61.2	4.8	33.2	1.2	0.1
Kommunarsk	Ukraine/Donets-Dnieper	254.6	81.7	20.1	128.8	13.8	3.8	6.4
Dnistrovsk	Moldavia	252.7	37.7	178.2	36.6	0.2	0.0	0.0
Karaganda	Kazakhstan	245.3	61.7	43.2	109.5	15.4	15.0	0.5
Novotroitsk	RFSFR/Ural	240.7	40.8	22.2	156.7	17.0	2.1	1.9
Minsk	Belorussia	238.5	10.1	29.9	134.2	26.3	27.5	10.5
Fergana	Uzbekistan	233.8	18.9	28.0	92.9	20.4	70.4	3.2
Schabarovsk	RFSFR/Far East region	231.3	48.6	55.4	81.5	15.0	30.6	0.2
Orenburg	RFSFR/Ural	231.2	6.8	101.2	79.1	25.6	17.7	0.8
Odessa	Ukraine/Dniester region	228.6	19.1	15.3	139.0	12.4	37.9	4.9
Erevan	Armenia	226.0	5.0	15.4	150.2	18.0	35.7	1.7
Ryazan	RFSFR/Central region	225.0	7.8	43.8	72.5	12.2	77.1	11.6

Table 4. Pollutant Emissions of More Than 200,000 Tons in Individual Soviet Cities in 1988 (in 1,000 tons) (Continued)

City	Republic/Region	Total Pollutants	Of these: Suspended Matter	SO ₂	CO	NO _x	C _x H _x	Others
Nikel	RFSFR/North region-Kola	217.6	4.1	211.4	1.6	0.2	0.3	0.0
Alma Ata	Kazakhstan	211.3	9.7	15.6	145.5	14.4	24.0	2.1
Atschinsk	RFSFR/East Siberia	210.4	143.9	24.5	20.8	14.0	2.7	4.5
Krasnodar	RFSFR/North Caucasus	209.4	6.5	28.4	127.0	13.0	33.2	1.3
Serov	RFSFR/Ural	203.6	71.0	58.7	61.6	10.3	1.1	0.9

Source: *Toxic Waste Emissions in 1988*, Leningrad, 1989, p 273 ff.

Water Protection

The waste water volume in 1989 amounted to a total of 153.4 billion cubic meters, of which 110 billion cubic meters were only lightly polluted (for instance, cooling water), while 43.4 billion cubic meters were classified as needing purification. Of this water, only 25 percent was purified according to the limits set, while 32.7 billion cubic meters were passed into the system more polluted than permissible; 10.3 billion cubic meters of waste water were not purified at all. In past years, the limits of permissible pollution concentration in water have been lowered several times, so that the amount of waste water classified as excessively polluted has risen constantly (in billion cubic meters³)⁴:

	1985	1986	1987	1988	1989
Waste water needing purification	38.3	38.1	39.1	40.7	43.6
Of this amount:					
—Purified according to regulation	22.4	23.0	18.5	12.1	10.9
—Inadmissibly polluted	15.9	15.1	20.6	28.6	32.7
Of this amount:					
—Insufficiently purified	9.1	8.6	13.9	20.6	22.3
—Without purification	6.9	6.5	6.7	81.	10.3

Of the waste water classified as inadmissibly polluted in 1989, 3.7 billion cubic meters came from agriculture, 14.2 billion cubic meters from community systems, and 14.3 billion cubic meters from industry (Table 6). The major introducers of polluted waste water are the wood processing, cellulose and paper industries, the chemical,

petrochemical and petroleum processing industries, the metal industry, and the fertilizer and coal industries. Overall, the pollutants contained in waste water amounted to over 40 million tons in 1989, among them 21 million tons of sulfates and 19 million tons of chlorides (Table 7).

In 1989, in the catchment areas of the Caspian Sea 12.1 billion cubic meters of waste water were illegally released, for which the Volga and its tributaries alone accounted for 10.8 billion cubic meters. The major discharger here is the area of Moscow with over 5 billion cubic meters of polluted waste water. The numerous storage lakes of the Volga in particular show high concentrations of heavy metals, petroleum products, and phenols.

In 1989, 3.6 billion cubic meters of polluted waste water were illegally discharged into the catchment area of the Baltic Sea (Table 5). Among the harmful substances are 58,000 tons of nitrogen, 352,000 tons of organic matters, 375 tons of zinc, 42 tons of lead, and 167 tons of copper compounds. With 523 tons, 57 percent of the country-wide phenol introductions come from Estonia. Municipal sewage from Leningrad, Tallinn, Riga, Klaipeda, and Kaunas contribute substantially to the pollution of the Baltic Sea. The most important industrial discharger is the cellulose and paper industry. Particularly critical at the Baltic coast is the concentration of heavy metals, phenols and hydrocarbons in the water.⁵

The illegal discharge of polluted waste water into the catchment area of the Black Sea and the Azov Sea amounted to almost 8 billion cubic meters in 1989. In the Black Sea, high concentrations of phenols and hydrocarbons were registered at Odessa; the Azov Sea in several places is heavily polluted with petroleum products, phenols, heavy metals, and DDT.⁶

Table 5. Waste Water Discharge in the USSR (in million cubic meters)

Republic	Total Amount of Waste Water					Of Which, Amount Exceeding Permissible Levels of Waste				
	1985	1986*	1987	1988	1989	1985	1986*	1987	1988	1989
USSR	38,302	38,042	39,090	40,641	43,584	15,928	15,074	20,620	28,646	32,652
RSFSR	25,967	25,501	26,284	27,899	30,633	11,981	11,170	16,723	23,323	27,146
Ukrainian SSR	5,835	5,936	6,010	6,396	6,706	1,299	1,187	1,152	2,634	2,900
Belorussian SSR	821	892	930	958	994	93	80	80	63	65
Uzbek SSR	1,303	1,337	1,402	831	762	411	401	390	349	265
Kazakh SSR	607	584	632	618	591	280	292	316	340	339
Georgian SSR	622	602	602	626	626	343	337	372	317	317
Azerbaijan SSR	623	624	603	601	597	450	418	404	349	291
Lithuanian SSR	422	432	411	449	450	334	337	295	326	336
Moldavian SSR	264	267	271	288	298	41	112	100	91	91
Latvian SSR	365	357	363	366	367	247	232	250	257	257
Kyrgyz SSR	195	160	177	191	180	12	8	6	14	40
Tajik SSR	247	257	267	297	286	60	67	81	91	110
Armenian SSR	539	587	600	608	557	180	235	248	295	248
Turkmen SSR	22	15	13	13	20	1	1	1	0	1
Estonian SSR	470	490	526	500	517	196	196	203	197	246
Baltic Sea	4,513	4,489	4,488	4,434	4,727	2,753	2,469	2,648	3,434	3,616
—Neva									1,310	1,540
—Lake Ladoga	465	455	400	392		265	255	360	392	
Black Sea and Azov Sea	10,246	10,343	10,344	11,407	12,950	3,586	3,413	3,724	5,627	7,909
—Black Sea									1,960	
—Dnieper	3,333	3,392	3,480	3,758	3,893	933	882	870	1,418	1,713
Azov Sea									3,667	
—Don	2,141	2,225	2,318	2,471	2,615	471	445	788	1,451	1,595
—Kuban									1,212	2,090
Caspian Sea	12,352	12,319	12,821	13,845	14,200	3,582	3,449	7,821	11,395	12,070
—Kura									522	
—Volga	10,079	9,897	10,356	11,439	11,889	2,419	2,177	6,576	10,209	10,819
—Oka									4,241	
—Kama									1,807	
—Ural	200	198	220	205	229	40	38	40	125	149
Aral Sea									570	
—Amu Darya									94	
—Surdarja									357	
Amur									462	640
Lena									107	
Yenisey	1,846			1,250		1,126			2,078	2,800
Ob	3,681			3,970		4,038		1,951	2,654	2,988
Lake Baykal	181	188	193	195		124	66	107	192	198

Table 5. Waste Water Discharge in the USSR (in million cubic meters) (Continued)

Republic	Total Amount of Waste Water					Of Which, Amount Exceeding Permissible Levels of Waste				
	1985	1986*	1987	1988	1989	1985	1986*	1987	1988	1989
Northern Dvina									812	
Pechora									50	

*Estimates: Without cooling water and lightly contaminated waste water.

Sources: Statistical yearbooks of the USSR and the RSFSR 1988 and 1989; *Preservation of the Environment and the Rational Use of Natural Resources in the USSR*, Moscow, 1989; *The State of the Environment and Conservation Activities in the USSR in 1989*, Moscow, 1990; *MAN AND THE ENVIRONMENT*, No 12/1990 p 55; *GLASNOST*, No 13/1990, and estimates by DIW.

Table 6. Discharge of Waste Water Exceeding Permissible Levels by Source (in million cubic meters)

Source	1985	1987	1988	1989
Total	15,929	20,620	28,646	32,652
Municipal sector	5,807	9,217	12,948	14,200
Agriculture			2,400	3,700
Industry, total			12,800	14,300

Discharges by Industries Under Central Ministerial Control (by sector):

Wood, cellulose, and paper industry	2,520	2,694	2,718	2,660
Iron and steel industry	1,040	1,084	1,320	2,170
Nonferrous metal industry	646	490	629	
Fertilizer industry	671	961	1,104	1,000
Electricity-producing industry	264	314	1,097	
Chemical industry	462	512	959	2,610
Petroleum-processing and petrochemical industry	455	552	1,251	
Coal industry	336	444	574	850
Pharmaceutical industry	173	178	185	
Construction materials industry	64	85	56	

Discharges by Industrial and Municipal Enterprises (by republic):

Russian federation	5,187	6,974	12,357	
Ukraine	559	494	1,301	2,900
Lithuania	293	257	312	336
Azerbaijan	305	317	288	291
Latvia	216	226	252	257
Belorussia	70	55	48	65

Sources: *The State of the Environment in the USSR in 1988*, Moscow, 1989, p 66ff; *The State of the Environment and Conservation Activities in the USSR in 1989*, Moscow, 1989 p 175ff; *Preservation of the Environment and the Rational Use of Environmental Resources in the USSR*, Moscow, 1989, pp 34, 80.

Table 7. Discharge of Harmful Substances Into the Waste Water in the USSR in 1989

Republic	Waste Water Discharge Exceeding Permissible Levels	Harmful Substances														
		B.O.D	Mineral Oil Products	Suspended Matter	Sulphates	Chlorides	Phosphorus	Ammonium	a-Nitrates	Tensides	Copper	Iron	Zinc	Nickel	Chromium	Mercury
	In billion cubic meters	In 1,000 tons										In tons				In kilograms
USSR	32.7	1,599	74	2,236	20,953	19,189	65,689	240,056	925	15,726	1,002	37,435	2,367	915	967	1,978
RFSFR	27.1	1,067	29	1,646	11,528	8,503	52,440	175,732	280	12,554	805	34,041	2,040	742	752	1,714
Ukrainian SSR	2.9	136	7	155	1,398	1,081	7,896	28,839	72	1,124	94	1,924	22	68	92	119
Belorussian SSR	0.1	19	1	21	371	1,216	838	7,822	0	180	20	242	35	63	33	
Uzbek SSR	0.3	105	24	102	257	809	121	3,846	5		4	69		2		
Kazakh SSR	0.3	12	0	34	164	97	694	5,684	2	595	26	113	51	0	4	143
Georgian SSR	0.3	20	2	56	17	2	0	241	10	0	0	41	0	0	13	
Azerbaijan SSR	0.3	17	4	33	2,024	324	544	2,945	28	512	2	247	2			
Lithuanian SSR	0.3	64	1	48			881		0	2	32	464	88	35	51	
Moldavian SSR	0.1	6	0	9	45	48	636	27	2	64	0	26	0	0	1	
Latvian SSR	0.3	47	1	35	7	15	944	0	2	525	5	159	11	3	11	
Kyrgyz SSR	0.0	4	0	8	7	8	37	933	0	64	3	60	118	2	8	2
Tajik SSR	0.1	5	0	9	1,912	1,475	0	890	19	1	25	1	1	2		
Armenian SSR	0.2	48	6	49	2,942	3,258	70	292				9	15			
Turkmen SSR	0.0	0	0	0	152	2,322		20	0	4		0				
Estonian SSR	0.2	49	0	31	130	31	588	12,782	523	83	2	6	0	0	1	

Source: *The State of the Environment and Conservation Activities in the USSR*, Moscow, 1990 p 99

Waste Removal

Completely unsolved as yet are the environmental problems linked to waste removal. At present, some 300 million tons of waste with toxic substances are incurred in industry, of which 250 million tons are dumped and not quite 40 million tons are processed or rendered harmless. The amount of industrial toxic waste in the narrower sense is listed as approximately 30 million tons, and the amount of solid household garbage as about 60 million tons.⁷

Industrial waste, including toxic waste, is often stored in unsecured dumps. Company land is predominantly used for these purposes, but sometimes also household garbage dumps. There are no regional, secured toxic waste dumps; a government decision made in 1984 to establish

such dumps was not implemented. For most toxic substances there are no procedures for their reuse, rendering them harmless, or risk-free dumping. In numerous cases, due to industrial waste dumps groundwater has been contaminated with heavy metals or toxic chemicals, for instance, in Kazakhstan and at the Donets basin.

In the removal of domestic garbage, trash incineration plays only a minor role with a rate of 2.2 percent; 96.5 percent of domestic garbage is dumped, 1.3 percent is processed. In the next 15 years, the percentage of trash incineration and processing in the RFSFR (Russian federation) is to be raised to 20 percent. However, there are problems with trash incineration because of emissions of dioxin, hydrochlorine, hydrofluor, and hydrocarbons as well as heavy metals. There is a lack of equipment for efficient emissions control.

Nuclear Installations Endanger the Environment

Five years ago, the so far most serious catastrophe in a nuclear power plant occurred near Chernobyl. Belorussia was particularly hard hit by it. The radioactive contamination (fallout) of the republic is listed as 70 percent of the bomb on Hiroshima. More than half of the radioactive fallout of the damage in the European part of the USSR occurred in the area of Gomel alone.⁸

To this day, there is no clear picture of the effects of the disaster on the environment and the health of the population. Official data are often questioned. But even the official data bespeak high radiation in the region of the catastrophe. Twenty percent of the agricultural land in Belorussia, and 12 percent in the Ukraine, are considered radioactively contaminated. In 1989, the concentration of Caesium-137 in the air in Kiev was three times as high as the Soviet Union's average, 11 times as high in Minsk, and 13 times as high in Gomel. Nationwide, radioactive precipitation was 9 Bq/m² of Caesium-137 annually; in Kiev it was 130, in Gomel 82, and in Minsk 21 Bq/m².⁹ At the end of 1989, 3.9 million people lived in areas with increased radioactive stress, 2.1 million of them in Belorussia, 1.5 million in the Ukraine, and 300,000 in the RSFSR. In the living areas of 268,000 people, the radioactive burden on the soil with over 15 curie/square kilometer of Caesium-137 is so high that their resettlement is urgently necessary under a law passed in the Ukraine in March 1991.¹⁰ The economic costs of the reactor catastrophe are estimated at up to 250 billion rubles, not taking into account costs linked to health damage.¹¹ The destroyed reactor is causing growing concern, since 185 tons of nuclear fuel are assumed to be buried under its rubble. Its concrete shell in the long run cannot withstand the radiation; furthermore, radioactive contamination of the groundwater and the Dnieper is also feared.¹²

High radioactive environmental stress also exists in other regions, particularly in the neighboring districts of the Semipalatinsk testing ground and in the area 100 kilometers north of Chelyabinsk. At this location of the plutonium industry, an explosion occurred in 1957 in a storehouse for radioactive waste whereby more than 2 million curies were released. Part of the complex was shut down, but spent fuel rods from nuclear power plants are still being processed there. Large amounts of nuclear waste are stored in the bodies of water, 120 million curies of radioactive substances in Lake Karachay alone. A 200-kilometer stretch of the Techa River had to be declared a prohibited area because of radiation stress. The ensuing effects of the 1957 catastrophe can still be felt.¹³ In the area of Sverdlovsk, a village had to be evacuated due to radiation caused by an unsecured nuclear waste dump.¹⁴ In the spring of 1990, excessive radioactivity was found in deer and fish near Tomsk, a consequence of the improper waste disposal of the local nuclear power plant.¹⁵

Causes of the Environmental Crisis

The deficits in environmental protection cannot simply be attributed to the lack of financial possibilities. After

all, environmental damage is estimated at 50 to 70 billion rubles annually. Environmental investments are only one-twentieth of this amount. What is lacking is an effective mechanism to internalize the external costs of environmental pollution. In the traditional plan index system as well as in self-financing, environmental protection measures have a negative effect on enterprises' success criteria, and hence on their financial resources. So neither the enterprises nor the sector ministries, oriented toward plan fulfillment, have an interest in environmental protection. Low raw material and energy costs have fostered waste; soil and water up to now have been utilized free of charge or at minimal rates. Subsidizing unprofitable enterprises has led [to the situation] where there was no economic pressure to deal sparingly with the existing resources.

The investment and structural policies are also an important reason for environmental problems. The service life of installations exceeds by far that of the West, [and] replacement values are inadequate. In the heavily polluting sectors of power production and the iron and steel industry, the average service life of fixed assets is about 50 years. In 1989, more than half of the steel was produced according to the Siemens-Martin process. A considerable part of environmental pollution is thus caused by obsolete and badly worn production installations, which have a high consumption of raw materials and energy and are very prone to breakdowns. Furthermore, in the sectoral structure of investments, the power producing industry and metal industry are given too much weight. Almost half of all investments in industry during 1986 to 1989 were made in these areas, 40 percent in the "fuel and energy complex" alone. At the same time, little was done to promote energy savings measures. Investment policy remained one-sidedly oriented toward increasing the energy supply.

The environmental crisis in the USSR is the result of an extensive economic growth, i.e., based on a constantly rising input. It was linked to a misallocation of capital whose consequences are equally disastrous for both the economy and ecology. Unlike in the West, there has been hardly any economic structural change; the sectors of heavy industry close to basic materials dominate. The numerous obsolete installations cause high production costs and great environmental damage. The ecological crisis in the Soviet Union cannot be solved by subsequent environmental protection; often it is also no longer justified economically. What is needed is a restructuring of the Soviet economy, including environmental protection; important in that is the reduction of raw material and energy consumption. Such an economic-ecological modernization process ought to be supported by the West in its own interest. However, the preconditions for a successful environmental protection policy must first of all be created by the Soviet Union itself. This includes, above all, eliminating subsidies for energy consumption and implementation of the principle that the pollute must pay, i.e., internalizing the external costs of environmental pollution, and the creation of market economy framework conditions in general.

Table 8. State Environmental Investments and Putting Into Operation Environmental Protection Installations

	1976-80 ¹	1981-85 ¹	1986	1987	1988	1989	1986-89 ¹
In million rubles, 1984 prices							
Total state environmental protection investments	2,165	2,224	2,615	2,663	3,122	3,255	2,914
—Water protection	1,668	1,617	1,798	1,902	2,091	2,166	1,989
—Clean air	190	180	263	273	317	404	314
—Soil protection	222	235	249	274	393	441	339
—Measures against soil erosion	—	158	151	179	217	229	194
—Protection of mineral resources and efficient use of mineral resources	—	106	216	144	217	140	179
In million cubic meters per day							
Putting Into Operation:							
—Waste water purification installations	7.4	5.4	7.0	5.1	5.2	4.4	5.4
—Water circulation systems	24.3	24.4	24.6	29.9	15.5	15.9	21.5
In million cubic meters of gas per hour							
—Installations to keep air clean	34.5	40.0	38.8	48.2	25.8	31.2	36.0

¹AverageSources: Statistical yearbooks of the USSR, 1989 *Statistical Pocketbook of the USSR*, and *VESTNIK STATISTIKI*, No 6/1990.

Possibilities of Cooperation with the West in the Area of the Environment

The prospects for trade in subsequent environmental technology must be assessed skeptically. Although the need for desulphurizing installations, for example, is great, the USSR indebtedness permits hardly any appreciable imports. Better prospects probably exist for projects where environmental protection is linked to general modernization, particularly in the sectors important for exports. This applies to the petroleum and natural gas industry. In 1989, for example, 12.5 billion cubic meters of gas were burned off during petroleum production; production losses of the gas industry came to 13.7 billion cubic meters. A reduction of these losses would be ecologically desirable and economically advantageous. There are positive experiences in the nonferrous metal industry, such as modernizing the nickel industry on the Kola peninsula with Norwegian and Finnish help. There could also be the beginnings of meaningful cooperation in restructuring the chemical, pharmaceutical and cellulose industries where great supply difficulties on the domestic market have cropped up because of the shutdown of enterprises caused by environmental conditions.

Since the demand for environmental protection technology cannot be satisfied by imports, the Soviet Union needs to expand its own environmental protection industry. Environmental protection technology at present is produced in some of the chemical and petroleum installations, but not in an adequate amount and

sometimes of unsatisfactory quality. Joint ventures would permit a transfer of Western technology, Western capital and management to the Soviet Union, and from the latter's viewpoint it would be the most advantageous way to build up an environmental protection industry. But a commitment by Western enterprises can be expected only with purposeful market-economy reforms. Guarantees against intervention by state authorities must be ensured. A meaningful field of cooperation could be the conversion of armament enterprises to the production of environmental technology. This conversion is a component of the long-term program for environmental protection to the year 2005.

A significant area of cooperation is reactor safety. The catastrophe of Chernobyl underlined the urgency of cooperation in this field. Pronounced safety deficits exist above all in the older nuclear power plants of the WWER-440 and RBMK-1000 types, and one should work toward shutting them down. In general, there are frequent complaints about the unreliability of electrical equipment, the antiquated level of automation, inadequate process control and control installations as well as insufficient training of personnel in case of disruptions. Needed are an improved exchange of information about cases of disruption and stronger cooperation in the technical area and in training.

Cooperation in the area of environment on the state level is often seen too one-sidedly under in terms of financial transfers. But the extent and effect of Western financial

aid should not be overestimated. Fundamentally, the principle that the polluter must pay must also remain dominant in international environmental protection. The material preconditions for improved environmental protection in the Soviet Union must be created through an investment policy directed at saving resources and through lowering defense expenses. Support for environmental protection by Western countries must not go beyond "help toward self-help." As a rule, only pilot projects can be promoted; in addition, international cooperation can improve the framework conditions for enterprise activities in this area. However, more extensive state aid should be granted for overcoming the subsequent burdens of the Chernobyl catastrophe.

The environmental administration played only a minor role in the planned economy. Establishment of an efficient environmental administration could thus be the subject of international cooperation. The compilation of environmental damage is also worthy of improvement. Most emissions data in the Soviet Union are estimated, not measured. There are measuring places for emissions, but their density is inadequate, and the reliability of their figures must be doubted. Therefore, assistance in building up a reliable measuring system should be given priority, otherwise the effectiveness of environmental protection measures cannot be controlled. Desirable would be the buildup of an environmental data bank for Europe.

A noticeable decrease in environmental contamination probably necessitates a considerable expenditure of capital. Hence credit financing is feasible only if environmental protection measures are integrated in modernization of production. These projects should be given priority by the European Bank for Reconstruction and Development and other international development banks.

One problem is the contractual partners. At present, the competences concerning economic and environmental policy are in dispute between the Union and the republics. Negotiations at the government level must, therefore, include the republics from the very beginning.

Conclusion

A reduction of environmental pollution in the USSR is also in the West's interest. Hence help is required in mastering the environmental problems. But nonrepayable state subsidies are justified only in exceptional cases so that the principle that the polluter must pay is not compromised. Loans should be granted with the emphasis on ecological-economic modernization measures, which simultaneously increase the performance capability of Soviet industry. Of special importance is the buildup of an efficient environmental protection industry in the USSR. In this connection, the West should facilitate technology transfer and support the conversion of the arms industry to the production of environmental protection technology. For joint ventures in this area, however, first the appropriate framework conditions must be created in the USSR. An important

field of cooperation is increasing reactor safety in Soviet nuclear power plants. Cooperation is meaningful in building up a reliable measuring system to ascertain environmental pollution.

Footnotes

1. See *The Environmental Situation and Environmental Protection Activities in the USSR 1989* (in Russian), Moscow, 1990, pp 11-12.
2. See "The State of Air Pollution and Emissions of Harmful Substances into the Atmosphere of Cities and Industrial Centers in the USSR in the Year 1988," *Emissions of Harmful Substances in 1988* (in Russian), Leningrad, 1989, p 273 ff.
3. *Ibid.*, p 203 ff.
4. Compare *Environmental Protection and Efficient Use of Natural Resources in the USSR* (in Russian), Moscow, 1989, p 62 ff and *The Environmental Situation and Environmental Protection Activities in the USSR 1989*, p 96 ff.
5. *The Environmental Situation and Environmental Protection Activities in the USSR 1989*, Chapter 1.7.3; *PRIRODA I CELOVEK*, No 12/1990, p 55.
6. *The Environmental Situation and Environmental Protection Activities in the USSR 1989*, Chapter 1.7.2 and 1.7.3; *METEROLOGIJA I GIDROLOGIJA*, No 11/1990, p 115 ff.
7. See *EKONOMIKA I ZIZN'*, No 5/1991, p 11; *PRAV-ITEL'STVENNYI VESTNIK*, No 40/1990, p 6.
8. See *CELOVEK I EKONOMIKA*, No 6/1990, p 39.
9. *The Environmental Situation and Environmental Protection Activities in the USSR 1989*, pp 83 and 189; *PRAVDA UKRAINY*, 7 Feb 91.
10. See *ENERGIJA, EKONOMIKA, TECHNIKA, EKOLOGIJA*, No 7/1990, p 3; *PRAVDA UKRAINY*, 22 Mar 91.
11. See *ENERGIJA, EKONOMIKA, TECHNIKA, EKOLOGIJA*, No 7/1990, p 2, and No 8/1990, p 3 ff.
12. Compare *PRAVDA UKRAINY*, 8 Feb 91 and *IZVESTIJA*, 10 Apr 91.
13. See *IZVESTIJA*, 5 Sept and 5 Oct 90 and *DIE WELT*, 1 Oct 90.
14. *IZVESTIJA*, 10 Jan 91.
15. *IZVESTIJA*, 3 May 90.

Lemeshev Reviews Morgun's Book on State of Environment

91WN0554B Moscow SELSKAYA ZHIZN in Russian
12 Jun 91 p 5

[Review of book "Konets Sveta? Ili..." [End of the World? Or...] by Fedor Trofimovich Morgun, Kiev, Radyanskyy Pysmennyk Publishing House, 1991, by Doctor of Economic Sciences Professor M. Lemeshev, head of the laboratory for ecological-economic problems

of a commission of the USSR Academy of Sciences and a UN expert on the environment, under the rubric: "New Books: Our Common Pain"]

[Text] People have only really come to notice and be aware of the global changes in the habitat on the planet, resulting from the rapid expansion of industrial and economic activity, in the last 15-20 years. Ecological concerns encompass all of mankind today.

Irresponsible technocrats use outer space itself, and not only the atmosphere, as a "scrap heap" due to their ecological ignorance. All of this is having a ruinous effect on the weather and the conditions for the influx of solar radiation—and thus on the whole environment, the habitat of people and everything living on Earth.

The broad public in the highly developed industrial countries is aware of the lamentable consequences of that approach to the management of nature. Scientists are literally stunned by the depressing information on the destruction of natural systems and the growing ecological trouble around the world. And the flow of that information is increasing.

People are becoming more and more distinctly aware that their prosperity and well-being depend more and more on the health of the environment.

Despite the impending ecological catastrophe, however, the industrially developed countries are mindlessly plundering natural resources. Many of them are either close to total depletion or can be utilized only on a limited scale, as with hydroelectric power. The paradox is that the closer those resources are to depletion, the more intensively their development is proceeding. Other sources of energy—geothermal or solar power, for instance—are, at the same time, not being utilized at all or are resorted to only in rare instances. And they are, after all, virtually inexhaustible. There is a clear underestimation by people of the power of the wind, tides and heat exchange from biomass, among others.

The world is at a line that cannot be crossed. The leading scientists of the world feel that the planet can withstand the contemporary burden for only a few decades, and then ecological catastrophe is inevitable. Sensible people with the gift of foresight are advancing bold ideas and rushing to incarnate them. There are many serious publications on this score. When becoming acquainted with the book by F. Morgan titled "The End of the World? Or..." (Kiev, Radyanskyy Pysmennyk Publishing House, 1991), you unwillingly come to the conclusion that you have before you a concentrated and all-encompassing analysis, deeply felt by the author, of the state of nature on Earth and, at the same time, a visible search for ways to save it.

This book, small in size, presents rich factual material on the state of the environment in the Soviet Union and the world overall. The author sets forth experiences from the successful environmental-protection activity of science and practice in the USSR and the other industrial nations in popular and accessible form.

Fedor Trofimovich Morgan is far from a novice in the widespread propagation of ecological knowledge. He has been bringing to life the noble idea of a careful attitude toward our chief national asset—the land—for many years. His books devoted to boardless methods of working the soil, making it possible to preserve and improve its structure and protect against erosion, are well known and have been recognized by many readers, especially rural ones. Fedor Morgan was one of the first enthusiasts of the new biospheric thinking in cultivation, who understood that many of the laws of nature were criminally ignored in agriculture. His name is also linked with the incarnation of a new structure for state management of all environmental-protection activity in the country.

The son of a peasant, a person who loves the land not out of official duty but since his barefoot childhood in the village, with all his heart, Fedor Trofimovich argues with pain and alarm in his new book about what awaits mankind in the event that people do not radically alter their consumerist attitude toward the biosphere. "From the old habits to the new thinking," is the name of one of the chapters in "The End of the World? Or..." The author exclaims that "The disruption of the balance of society and nature is the common pain of mankind. It affects everything..." And he concludes that only the village is the most reliable protector and preserver of nature, and he expresses serious concerns on the score that, in the face of the enormous resources that the country has at its disposal, "the village is being kept on starvation rations or left to face its own problems one on one." The author reasonably calls into question the very thesis of the historical irreversibility of this destructive phenomenon: "The inevitability of a reduction in the rural population is an old and false myth... A far-sighted social policy should prepare the village for an energetic resurrection."

The conclusion that the most complex ecological situations that the country has been falling into, especially in recent years, are to a considerable extent the result of an excessive concentration of the population in the cities is a no less serious one.

And in order for the land not to be doomed to an orphan's vegetation once again, it is essential to resurrect the principle of inheritance "from the grandfather to the father to the son."

Many pages in the book are devoted to those people who helped the author master biospheric cultivation on the fields of Poltava, the goal of which was to feed people to the full without disrupting the environment.

This book by F. Morgan will undoubtedly become a reference book for ecological specialists, students and even pupils in grade schools, and will win widespread popularity among readers. It is a shame that it was issued in a small quantity. But that is, it must be assumed, a matter easily corrected.

New RSFSR Code on Mineral Wealth To Provide Stricter Controls on Resource Use

91UN2126A Moscow ROSSIYSKAYA GAZETA
in Russian 11 Jul 91 p 2

[Article by M. Vasilchuk, first deputy chairman of the RSFSR State Committee for Supervision of Safe Working Practices in Industry and for Mine Supervision, and V. Zimich, chief of the Administration for Supervision of Protection and Rational Use of Mineral Wealth, under the rubric "Ecology": "New Russian Code on Mineral Wealth Will Finally Make Enterprises Pay for the Environment"]

[Text] The exclusive state monopoly on mineral wealth, which in reality has grown into a departmental monopoly, has not brought anything to the mining regions except the predatory plundering of nature. The new Russian code on mineral wealth is designed to end the imperial approach.

Almost 90 percent of industrial output is currently produced from mineral raw materials; this necessitates an enormous volume of mining of these minerals. In this respect, the USSR tops the list of world producers. The bulk of this mining is done in the RSFSR.

However, mineral wealth, no matter how substantial, is not limitless. For instance, if the use of zinc remains on the current world level, the remaining deposits are only enough for 20 to 30 years more.

The effectiveness of the current RSFSR Code on Mineral Wealth is diminished by excessive centralization of the mining industries and the lack of an effective economic mechanism; it also suffers from a departmental approach. This is not surprising, of course. The Code has generally existed as a mere repetition of the basic law of the USSR and of the Union republics on mineral wealth, with its concept of the state's exclusive ownership of mineral wealth; therefore, it has not reflected Russia's specific interests. In addition, many of its clauses were blocked by departmental executive regulations. Just like the basic law, it does not require payment for the use of mineral resources, and does not have an economic mechanism for regulating their use.

To correct these obvious shortcomings, the new RSFSR Code on Mineral Wealth should reflect the stipulations of the RSFSR Constitution, and of the RSFSR Laws "On Ensuring the Economic Basis of RSFSR Sovereignty," "On Property in the RSFSR," "On Enterprises and Business Activities," and others, related to ownership of the mineral wealth and the use of resources. It is important to define and differentiate in this code the powers of the RSFSR, and those of its constituent republics, krays, and oblasts.

It should also include preferential credits for increased extraction of raw materials and its comprehensive processing. It is clear that enterprises should be exempt from taxes on profits received from processing and realization of accumulated waste of mineral processing industries. At the same time, strict economic sanctions are needed

for excessive waste of raw materials, non-comprehensive processing, and damage to resources and deposits.

We think that in the future the use of mineral wealth should be granted on the basis of licensing. The right to issue licenses for geologic exploration, hazardous materials or waste disposal, and sewage disposal should rest with the RSFSR State Committee on Geology; to develop mineral deposits sites, and for the construction and exploitation of underground structures not related to mineral extraction—to the mine supervision organs; and for the extraction of commonly found mineral resources—to local soviets of people's deputies. In all instances, the issuance of licenses should be done with the consent of the soviets.

Tighter requirements are needed on the processing of mineral raw materials; at this stage of resource development, state mine supervision is needed in this area. Right now, for many types of minerals, losses during the enrichment process are double or triple—and sometimes five times higher—than those during extraction.

There is no need to argue again that only a rational, comprehensive use of resources can preserve the natural riches for future generations and to protect the interests of the peoples in the republic.

Scientists Draft Siberian Oil Exploration Program

LD2207011791 Moscow TASS International Service
in Russian 1915 GMT 21 Jul 91

[By TASS correspondent Viktor Yel'makov]

[Text] Novosibirsk, 21 July (TASS)—In the next five to seven years, it could be possible not only to arrest the drop in oil extraction in Siberia, but also to improve the structure of hydrocarbon reserves. This is the conclusion reached by some of Siberia's major oil scientists, who have drafted the "Exploitation" [Poisk] inter-industry program aimed at finding and developing new types of high-outflow and gas deposits in Siberia.

What do the scientists base their forecast on? One of the authors of the program, Alekey Kontorovich, deputy director of the Institute of Geology of the Siberian branch of the USSR Academy of Sciences and a corresponding member of the Academy explains:

"There are objective reasons why a major reduction has occurred. Among the new deposits being developed, the medium-sized and small ones are predominant. Outflows of wells are falling. This year Siberia will produce almost 100 million tonnes less oil than in 1988. What has happened has come as no surprise to scientists. Several years ago, Academician Andrey Trofim'yuk, the patriarch of Siberian oil scientists, forecast the threat of a crisis in the region's oil industry. He put forward at that time the idea of a purposeful search for high-outflow deposits, but unfortunately it did not find support with the government".

The situation is changing, however. Now, at a new stage, and with support of the State Science Committee, the USSR Ministry of Geology and the Russian Soviet

Federated Socialist Republic State Committee for Geology, the idea is being shaped into a large-scale inter-industry program. It will need at least R25 million a year for scientific support studies for exploration and surveys. Academic and industry-based institutes in Novosibirsk, Irkutsk, Yakutsk, Leningrad and other towns have been involved in it. The program includes several major scientific projects: basic research on a number of understudied topics, guidelines for oil and gas exploration in two regions—western Siberia, and eastern Siberia and Yakutia, and new, efficient and ecologically clean technologies for exploration and survey work.

The scientists gave a number of examples. The lower "storey" in western Siberia is virtually undeveloped. So far, only the first major discoveries have been made. In eastern Siberia, oil up to a billion years old has been found for the first time in the world. It is also becoming clear that in the depths of Siberia, apart from the classic traps in which oil and gas are concentrated, there are also other, very special ones which are so far poorly studied, and that there are meanwhile grounds to expect that they may contain considerable reserves. Remote methods of detection are extremely important in Siberia, under conditions of such expansive territory: exploration from space, aerial and magnetic surveys, and seismic and electrical surveying. These areas of exploration need to be combined with deep drilling. However, until recently these methods have frequently been used in isolation from each other and not in combination, the scientist reckons.

The "Exploration" program drafted by the scientists is being finalized. However, research collectives have begun work without waiting for its final endorsement. What is more, a foundation is already being laid for practical implementation of the recommendations being made by the academics. Representatives of Siberian science took part in a session organised by Russia's Council of Ministers, which examined the organization of the oil and gas industry in eastern Siberia and Yakutia. As a result of the meeting, instructions were given to draft an outline for development of the industry. A working group is now being formed. The Yurubcheno-Tokhomskoye, Verkhne-Chonskoye, Kavyktenskoye and a number of other major oil and gas deposits have already been discovered in the region.

Program of Health, Compensation Measures for Residents of Chernobyl-Affected Areas

91WN0535A Moscow ROSSIYSKAYA GAZETA
in Russian 18 Jun 91 p 3

[“Concept of Residence of the Population in Regions Affected by the Accident at the Chernobyl AES (approved by Resolution of the USSR Cabinet of Ministers No.164, 8 April 1991)"]

[Text] General Provisions

1. The Concept of Residence of the Population in Regions Affected by the Accident at the Chernobyl AES [nuclear power station] was developed in accordance

with the USSR Supreme Soviet Resolution of 25 April 1990 "On a Unified Program To Eliminate the Aftereffects of the Accident at the Chernobyl AES and Its Related Situation" and USSR Council of Ministers Resolution No. 645 of 30 June 1990.

2. The aim of this Concept is the formulation of principles and criteria providing the basis for practical measures directed toward maximum reduction of possible negative consequences of the accident at the Chernobyl AES, population health measures, and compensation for damages.

3. The following were taken into account in drawing up the Concept of the Population Residing in Regions Affected by the Accident at the Chernobyl AES:

all protective measures previously implemented, including resettlement of people out of regions suffering the effects of the accident;

available data on the radiation environment and radiation dosages of the population;

the state of health of the population and the sociopsychological environment in contaminated regions;

modern concepts of world science on the medical and biological effects of ionizing radiation;

principles of radiation protection and intervention-level recommendations in post-accident situations, including the recommendations of international organizations;¹

the state of agricultural production, the true extent of radioactive contamination of products (especially milk); prospects for reducing contamination and their effectiveness;

experience gained in the conduct of protective measures and data on their effectiveness (the Chernobyl accident and others), and possible undesirable consequences of mass resettlement;

the presence of other, non-radiation related factors influencing the health of the population;

specific protective measures which enabled significant reductions in radiation dosage of the population to take place over 1986-1990,² as well as the fact that during initial weeks following the accident, certain measures were not conducted in timely fashion or to the full extent. As a result, incomplete data show that tens of thousands of people received thyroid gland radiation higher than 0.3 Sv [Sievert].

4. In addition to placing emphasis on the radiation factor, this Concept also stresses the sociopsychological factor (stress, people's state of fear, or heightened excitement) characteristic of all extreme situations, but intensified in this instance by incomplete, and sometimes distorted information presented to the population regarding the true situation, the inadequacy of decisions made in applying protective measures and (or) their untimely implementation.

It is stressed that the accomplishment of measures aimed at decreasing accumulated dosage should at the same

time be directed toward reducing sociopsychological tension and stress in the population.

Main Principles and Criteria of the Concept

5. A person residing in territory contaminated by radionuclides, or who has resided there at least the established minimum period of time, has the right to award for damages according to procedure established by law in the form of benefits, compensations, and guarantees, in the social security and medical care systems.

6. The main index used in making decisions on the necessity for taking protective measures, their nature and scope, and for awarding damages is the radiation dosage caused by radioactivity due to the accident at the Chernobyl AES.

7. Emphasis is placed on the need to complete mandatory resettlement out of population centers (which listing is approved taking into account the established intervention level and socioeconomic conditions), and to conclude the urgent measures stipulated in the state Union and republic program for 1990-1992 on eliminating the aftereffects of the accident at the Chernobyl AES.

Implementation of the stated program and the conduct of efforts to lower dosages accumulated by the population and their predicted levels, when taken along with consideration of criteria recommended by international organizations, will make it possible to avoid a mandatory mass resettlement in the future.

8. It is considered that additionally exceeding (above the natural and anthropogenic background radiation level for a given locality) the amount of radiation to the population from accidental radioactive decay as a result of the Chernobyl accident, yielding an average annual effective equivalent radiation dosage for 1991 and the subsequent period which does not exceed 1 mSv [milli-Sievert] (0.1 rem), is entirely permissible and does not require any intervention whatsoever.

For an additional radiation dosage level of 1 mSv (0.1 rem) per year and lower, conditions of residence and labor activity for the population do not require any restriction whatsoever. General medical and hygiene measures adopted for the USSR are applied in this territory.

9. Protective measures (countermeasures) must be taken when there exists an additional radiation dosage level of 1 mSv (0.1 rem) per year (above the natural and anthropogenic background level). These measures include:

the conduct, when necessary, of radiation monitoring of the environment and food products;

measures aimed at reducing the content of radionuclides in the air, soil, and water;

measures aimed at reducing the content of radionuclides in agricultural production;

reduction of accumulated dosages from the effects of radon entering premises from the environment, through the use of radiation diagnostics.

The package of protective measures must be aimed at effecting a permanent reduction of the accumulated radiation (including through the lowering of food-product contamination) while simultaneously relaxing restrictions which infringe upon people's accustomed way of life. Optimization of protective measures should be pursued under consideration of the condition that the average effective equivalent radiation dosage for 1991 not exceed 5 mSv (0.5 rem), with maximum possible annual reduction of this limit warranted by economic and social factors of up to 1 mSv (0.1 rem).

To encourage and monitor the conduct of protective measures, republic organs must establish annually for each population center (or group of population centers) differentiated radiation dosage monitoring levels, taking into account the level reached and the possibility of further reducing it.

It is necessary to develop a unified methodology for determining the dosage intervention levels from 1 mSv (0.1 rem) to 5 mSv (0.5 rem), and effect mandatory application of this methodology.

10. Protective measures, in addition to radiation protection, must include:

improved medical and hygienic services for the population, including special medical observation of high-risk groups, treatment at medical and health resorts, and health improvement;

provision of full-value nourishment;

measures for reducing sociopsychological tension and disadaptation (psychological consultation, regular dissemination of scientifically trustworthy information, organization of free economic zones, and other measures);

socioeconomic measures (compensation, benefits, guarantees).

The significance of each factor and its relative weight should be evaluated based on the principle of optimization to achieve maximum effect in protecting the health of the population dependent on funds invested.

11. We should proceed from the fact that an individual residing in territory contaminated with radionuclides has the right, based on objective information provided to him on the radiation environment, radiation dosages, and possible health consequences, to make an independent decision on continued residence in the given territory or resettlement to another place of residence. No decision made should yield direct economic advantages.

Conditions of resettlement (including priority and amount of compensation) may depend on accumulated dosage and the influence of ecological, social, and other factors. The development and implementation of appropriate plans are accomplished by Union and republic organs.

Here it is necessary to take into account the fact that the sociopsychological consequences of resettlement may

have a greater negative influence on people's state of health than the radiation factor in and of itself.

12. The effects of the Chernobyl accident on people's health and related protective measures must be examined in a package with other natural and anthropogenic risk factors (chemical contamination of man's habitat, endemic characteristics and particular bio- and geochemical features of regions, other factors).

13. For the population receiving significant radiation dosages as a result of the Chernobyl accident, a set of measures must be introduced for special permanent medical observation of the state of health, health restoration, and prevention of illnesses. Special attention is required for the following high-risk groups:

children who have received thyroid gland irradiation above 0.3 Sv (30 rad);

certain population groups, especially those who participated in eliminating the aftereffects of the Chernobyl accident (including military servicemen) who received external and internal irradiation in excess of the established limit for accidents.

14. A functioning state register of persons subject to effects of radiation as a result of the Chernobyl accident will be maintained at all levels—from rayon to Union. There will be increased supervision of the objectivity of initial data entered in this register on the state of health and incidence of sickness of the population.

15. Measures for protecting the rights and health of citizens who are in the zone of influence of unfavorable factors arising as a result of the Chernobyl accident and citizens who participated in eliminating its aftereffects must have comprehensive legal guarantees. To this end, the development and adoption of supplementary appropriate legislative acts and other normative acts are necessary.

16. Large-scale fundamental and applied research must be continued in radiation medicine, radiation genetics, radiobiology, radioecology, and agricultural radiology, as well as in socioeconomic and psychological factors related to problems of the influence of the Chernobyl accident on the health of the population.

Footnotes

1. The Atomic Energy Agency of the Organization of Economic Cooperation and Development developed recommendations in 1990 on intervention levels in the event of nuclear accident. For the intervention level in excess of which evacuation (or resettlement) is required, the following irradiation dosage amounts are proposed: 0.5 Sv (50 rem)—whole-body irradiation, and 0.3-0.5 Sv (30-50 rem)—effective dose for short term (days-weeks) and long-term (months-year) irradiation, respectively. The value proposed for the level of non-intervention is 0.1-1.0 mSv (0.01-0.1 rem) for the first year following the accident.

2. In 1989 in the Strict Control Zone (where cesium-137 radiation contamination density was 15 curies per

square kilometer and higher), average internal irradiation dosages (according to measurements from individual emissions counters) equalled 0.3-0.6 mSv (0.03-0.06 rem), which amounts on the average to 15-30 percent of the external irradiation dosage.

Kiev Residents Respond to IAEA Chernobyl Report; Invite Organization To Move to Pripyat

LD1907171591 Kiev Radio Kiev International Service in Ukrainian 2200 GMT 18 Jul 91

[Text] Esteemed listeners, we are offering you a letter of invitation to the International Atomic Energy Agency [IAEA], which appeared in the daily paper VECHIRNIY KYYIV entitled: "Move Your House to the City of Pripyat."

This proposal was sent to IAEA headquarters in Vienna by Kievites Hlazovyy and Ivanov. This idea came to them after they, as members of the Greens, became acquainted with the report on the consequences of the Chernobyl disaster, a report that was written by so-called independent experts of the IAEA.

When you informed us, the letter's authors write, that the diseases of our children, the poisoned towns and villages, and animal-monsters exist only in our imagination, and that 7,000 liquidators [those who took part in the post-explosion clearance program] died as a result of a purely incidental coincidence of circumstances, we felt great relief. Naturally, we have decided to reciprocate.

Since the poor ecological state of Vienna and the high degree of its exhaust pollution and noise negatively affect the health of its inhabitants, whereas the city of Pripyat is free from vehicles and noise and abounds with unoccupied buildings, we propose to you, out of sincere gratitude, to move the atomic capital of the world precisely there. The wonderful air and water available in Pripyat, they add, will help you to continue, with no effort spared, the propaganda of great achievements of atomic engineering.

We believe that many Kievites would undersign this proposal, and not because we are hospitable people. It is interesting what the response to this invitation will be in Vienna, in the IAEA headquarters.

Belorussia Appeals to European Parliament for Chernobyl Aid

LD3007001991 Minsk ZVYAZDA in Belorussian 18 Jul 91 p 1

[“Appeal by Belorussian Soviet Socialist Republic Supreme Soviet to the European Parliament”]

[Text] The world community marked the fifth anniversary of the Chernobyl tragedy by solidarity common to all mankind with the victims of the nuclear catastrophe, the biggest in the history of world civilization, and by fundamental reassessment of its lessons. The world only now comes to realize in full the global and regional problems brought about by the Chernobyl catastrophe, the character of its unprecedented results which is hard

to analyze, the postponed affects for the health of millions of inhabitants of the affected areas of Belorussia, the Ukraine, and the western parts of the Russian Federation.

The Belorussian SSR was affected most of all, which has been recorded, in particular, in UN General Assembly Resolution No. 45/19 of 21 December 1990 which was accepted on the basis of consensus. This fact was also widely stated at the international scientific conference on radio-biological consequences of the Chernobyl break-down, which took place on 21-24 May 1991 in Geneva at the headquarters of the International Atomic Energy Agency.

Belorussia received 70 percent of long-living isotopes. They have contaminated about 20 percent of all the agricultural land and forests—a quarter of all the republic. Over 2.2 million people live in the contaminated territory—every fifth inhabitant of the republic or half of those affected by Chernobyl in Belorussia, the Ukraine, and Russia.

The estimate remains uncertain on the harm caused to the health of the population as a result of the "iodine strike" and activity of other short-living isotopes in the first several days after the accident. They were not recorded. Despite the difference in evaluation of radiological consequences and protective measures, the international Chernobyl project has established that the complex effect of various unfavorable factors has led to the registered increase in illnesses of the population of the affected areas of the republic. The international consultative committee recommends that energetic measures be initiated with the object of increasing the quality of medical service, radical improvements in the provision of medicines, diagnostic and examination equipment, and materials.

Appraising the real situation, the Supreme Soviet of the Belorussian SSR appeals to the European Parliament to provide additional special financial, technical, and other help, direct or through another agreed mechanism, for solving the post-Chernobyl problems in our republic.

The Supreme Soviet of the Belorussian SSR also joins the address by the USSR president to the governments of all countries and the international community and the address by the UN secretary general to all the international community in connection with the fifth anniversary of the accident at the Chernobyl nuclear power station. We hope that the Belorussian people will not be left without attention and will be granted all the necessary help which it needs at the present moment.

The help granted as a charitable act from the international community will be dutifully appreciated by our people and will also be an example of international cooperation in overcoming global catastrophes.

Adopted by the Supreme Soviet of the Belorussian SSR, 27 June 1991.

Scientists Evaluate Chernobyl Effect on Belorussia's Forests

LD2207184491 Minsk Radio Network in Belorussian 0300 GMT 22 Jul 91

[Text] At last, Belorussian scientists [words indistinct] have produced a final estimate of the scale of the aftermath of the Chernobyl catastrophe. The state forest resources of Gomel Oblast cover 1.6 million hectares, of which 98 percent have been examined for radioactive contamination. The radiation has affected 946,000 hectares, or almost 60 percent of all the forests tracts. One can consider them lost for people for a long time, if not forever. Now one cannot collect mushrooms or berries or even stock timber there. The scientists are now dealing with the problem of planting forests in the territory, which has a contamination level of over 80 curie per square km.

Latvian Government Offers Aid Plan For Republic's Chernobyl Victims

OW2207090291 Moscow BALTFAX in English 1230 GMT 20 Jul 91

[Following item transmitted via KYODO]

[Text] The newspaper DIENA reports that at a 17 July session the Latvian government met the demands for better social protection made by Latvian residents suffering diseases after Chernobyl disaster. Latvia so far has not approved the decision by USSR leadership on social protection of Chernobyl victims because, in its opinion, responsibility for the disaster lies with the Soviet Union.

Latvian Health Minister Edvins Platkais stressed that the Latvian government's plan on aid to Chernobyl victims had been worked out with active participation of the Chernobyl Association. According to this plan, Chernobyl victims will be granted free use of transport.

The plan also envisions privileges to Chernobyl's victims' children born after the disaster, as well as to those evacuated from the contaminated zone. Those who have worked in the Chernobyl zone will get additional leaves, free medicines, vouchers to sanatoriums and out-of-turn health service at polyclinics and hospitals. The newspaper SOVETSKAYA MOLODEZH says the implementation of the plan will require 10 million rubles annually.

USSR Nuclear Society Conference on Radioactive Waste Disposal

Factors Influencing Lack of Concrete Progress
91WN0577A Moscow IZVESTIYA in Russian 29 Jun 91 Union Edition p 2

[Article by S. Leskov: "Requiem for Radioactive Waste"]

[Text] A large international symposium, at which scientists from the leading industrial countries discussed the problem of disposal of radioactive waste, came to an end in Moscow.

No matter how hard the specialists campaigning for atomic power try, social opinion polls affirm that confidence in atomic power continues to decline. Of all its "components," the figures relative to disposal of radioactive waste formed during AES [nuclear electric power plant] operation, are climbing most rapidly. It is evident that these data have made it possible for the first deputy minister of the USSR Atomic Power Ministry to announce that the fate of the sector will be determined by how, along with AES safety, the problem of radioactive waste disposal is solved.

But has enough attention been given to our most important problem? That question is not so simple. Atomic power in the USSR has historically developed based on the military sector and has adopted from it a particularly technocratic approach with a natural inability to take into consideration mankind's interests. Its orientation to the end result, appeal to ideology, sector self-centeredness, negation of alternative paths, and blocking of scientific research in other directions—all this could not help but have an effect on nuclear waste disposal. Experts admit: here we have fallen behind developed countries. We do not even have a suitable test ground. The question of building it in Chelyabinsk-40 is only beginning to be explored, yet, for example, I myself have seen a stone tomb similar to an underground palace almost completely finished in little Finland. And it is typical that if the western specialists reported on already existing, concrete projects, our specialists, while they spoke clearly and knowledgeably, spoke mainly about plans that exist for the time being only on paper. And as is well known, with plans in our country there was never any "push."

Yes, and now money is very tight in atomic power. Consequently, the minister's strategy for solving ecological problems is to reduce extraction of uranium, its enrichment and repeated utilization in different sectors of the economy. A factory is being built for this purpose in Krasnoyarsk, and if the public can be successfully convinced of its safety, we propose to execute foreign orders in it, naturally with a return of the treated fuel to the customer.

It has often been noted that "green" enthusiasts and atomic enthusiasts speak in different languages. Maybe the problem of disposing of radioactive waste will turn out to be the connecting link that will help the sides understand each other. Here the interest of the "green" movement and the department are the closest. Even if all the AES were closed, the problem itself would not go away. It is not surprising that an Association for Disposal of Radioactive Waste was recently created in our country. One thing draws attention: Academician Ye. Shemyanin was named to head it. And what about the Higher Certification Commission headed by him, which is literally overrun with scientists' complaints? It seems it is enough to manage one business...

Perhaps representatives, especially of the humanitarian sectors of science, are present for the first time at a

symposium on atomic power problems. It is an important fact affirming the department's new view on the problem. I think the specialists have drawn useful recommendations for working with the public from the report of the group of psychologists under the direction of USSR Academy of Sciences corresponding member A. Brushlinskiy. These recommendations are all the more important, since from the bravura report prepared by the departmental public information center, it appeared that the art of working with atomic enthusiasts must still be studied and studied. It is not without reason that during this report some from the "greens" shouted to the presenter: "While you campaign for atomic power, we are quiet for the "green" movement.

It is not necessary to drag it out any further; the ecological state of many regions causes apprehension partly because of the radiation factor. For comparison: the American National Academy of Sciences had already published the first report on this problem in 1956.

Nuclear Experts, Greens Share Dialogue

PM1907091591 Moscow PRAVDA in Russian 18 Jul 91
First Edition p 1

[N. Knyazkaya report under the "Conferences" rubric: "From Confrontation to Dialogue"]

[Text] Just two facts from the annals of Soviet "post-Chernobyl" nuclear power generation. In the summer of 1990 at a number of AES [nuclear electric power stations] (Rostov, Khmelnitskiy, and Balakovo) there was picketing and even a blockade of the power stations, and their workers were subjected to threats and insults. Only a little later that year and the following year, a number of Russian Soviet Federated Socialist Republic [RSFSR] and Kazakh oblast soviets—Voronezh, Kursk, Tver, Chelyabinsk, Murmansk, and Magadan, in particular—adopted decisions that approved the beginning or continuation of the construction of AES's on their territories.

I would like to hope that this is the confirmation of a generally indisputable truth: The rehabilitation of the nuclear power industry is possible only as a result of its regaining the trust that it has lost among the population, which must become convinced that the decisions proposed by specialists are safe. All this requires a search for new forms and methods of work with the public, which must be based on dialogue and not confrontation.

An example of such dialogue was the routine annual conference of the USSR Nuclear Society, to which, in addition to Soviet and foreign specialists, representatives of the antinuclear opposition from various "green" organizations in our country such as the RSFSR Society for Nature Conservation, the Socio-Ecological Union, the Ecological Front, and others, were invited. And although the conference was devoted to a problem which, as it may appear at first sight, was purely technical—how to deal with radioactive waste—the "greens" participated actively in the discussion of the questions.

The discussion showed that a number of mistakes and inaccuracies in the reasoning of the "greens" result from a lack of information. Nuclear specialists in their turn should learn to calmly hear out the other party's opinion and find clear arguments to back up their point of view. That was why the leaders of the Nuclear Society invited the "green" movement activists and all those wishing jointly to gain an understanding of all the controversial questions and ultimately to try to find a common language. Certain prerequisites for this already exist: After all, it is with respect to the problem under discussion that the interests of the nuclear industry and of society coincide to the greatest degree. As one of the nuclear experts stressed, "we are all green" here. Indeed, regardless of whether or not the nuclear power industry will develop in the future, waste will still have to be buried anyway.

Atomic Reactor Construction in Dushanbe Stopped

LD1707210791 Moscow All-Union Radio Mayak Network in Russian 1600 GMT 17 Jul 91

[Text] A session of the Dushanbe city soviet has made a decision to stop construction of the atomic reactor Argus. The building was being erected within the city limits, on subsident grounds and in the nine-degree seismic zone. The construction was not coordinated with the city fire brigade, the civil defense, or the sanitary and epidemic control station. It is frightening to imagine what could have happened if the city deputies did not interfere in this. The Tajik capital experiences earthquakes several times a year.

Construction of Two Underground Nuclear Power Stations Planned

LD2107102791 Moscow All-Union Radio Mayak Network in Russian 0800 GMT 21 Jul 91

[Text] It is planned by the year 2000 to have put two medium-capacity underground nuclear power stations into operation in the Soviet Union. This information was given at a conference in Moscow of Soviet scientists with a delegation of Japan's Atomic Industry Forum.

Specialists consider that the construction of underground nuclear power stations will provide more effective protection against radiation for the population and the environment. The construction of underground nuclear power stations does not rule out the construction of traditional nuclear power stations.

IAEA Findings on Safety of Crimea Nuclear Plant Protested

LD2207184291 Kiev Radio Kiev in English 2100 GMT 21 Jul 91

[Text] The International Atomic Energy Agency commission which studied the prospects of construction of a nuclear power station in the Crimea stated that the site chosen for its installation is perfectly safe. In this connection, groups of environmentalists of the Crimea held

several actions of protest. They said that the International Atomic Energy Agency commission defended the interests of the agency and ignored the demands of the public. In part the Greens emphasized that the survey was not carried out thoroughly, and that it did not take into account the structure of the station, which does not meet the seismic requirements. Several months ago the government of Ukraine adopted the decision that the Crimean nuclear power station should be converted into a training facility.

Human Errors Cited in Reduced Nuclear Plant Capacity

LD2307132491 Moscow TASS in English 1128 GMT 23 Jul 91

[Text] Moscow July 23 TASS—Soviet nuclear power plants worked only at 67 percent capacity in the first six months of this year, according to a safety expert.

Out of the 59 stoppages 20 were caused by human errors, senior nuclear safety expert Anatoliy Mazalov said in an interview published in today's TRUD newspaper.

In April unit number one at the notorious Chernobyl nuclear plant was stopped without the necessary protection, which was destroyed as a result of a short circuit, Mazalov said.

In May, three workers at the Ignalina power plant were exposed to high radiation doses while commissioning equipment, he said.

Most incidents were due to a lack of "safety culture among administrative and management personnel in the maintenance of reactors," Mazalov believes.

Kazakhs React To Proposed 'Very Last' Nuclear Tests at Semipalatinsk

PM2207215991 Moscow TRUD in Russian 23 Jul 91 p 1

[O. Kvyatkovskiy report: "Will There Be an Explosion?"]

[Text] Kazakh Soviet Socialist Republic—"I'll hand in my party card after the explosion," Olzhas Suleymanov, member of the USSR Supreme Soviet and president of the "Nevada-Semipalatinsk" Movement, stated to the Kazakh press.

The Semipalatinsk Nuclear Test Range has been quiet for around two years now. For the first time a popular [narodnyy] moratorium on tests of mass destruction weapons has worked. The antinuclear movement in Kazakhstan has had wide-ranging social repercussions and won many followers in the USSR and abroad.

But recently there was the first "leak" of information to the effect that another few "very last" explosions were being prepared at the range. The military then revealed their hand to the Kazakhs: The range will be finally closed for explosions as of 1 January 1992, but another three warheads need to be tested. The population will be paid 5 billion rubles as compensation.

Kazakh President N. Nazarbayev refuted reports that he had allegedly already sanctioned these explosions, stressing that the people would decide. For its part, the Kazakh Supreme Soviet is also reserving the final say for a regional referendum.

Preparations for polling the citizens are under way in Semipalatinsk, Karaganda, and Pavlodar Oblasts. It was in this situation that O. Suleymanov decided to state his view with his customary directness...

Meanwhile, holes have been drilled at the test range and, according to certain reports, nuclear warheads have already been placed inside and cannot be retrieved. It is being noted here that these charges are touchstones for republic sovereignty. These 300-kiloton "stones" should ultimately provide an answer to the question of who really has sovereignty in practice—the Semipalatinsk Test Range or the republic on whose territory it is located.

Experts Warn of Possible Nuclear Accident in Komsomolets Submarine Salvage

91WN0582A Moscow MOSCOW NEWS in English
No 23, 9-16 Jun 91 p 15

[Article by Vladimir Brodetsky: "Raising Sunk Nuclear Sub May Cause Another Chernobyl"]

[Text] *The Soviet nuclear submarine Komsomolets sank 400 kilometres off the northern coast of Norway in 1,685 metres of water after a fire on 7 April 1989. Of its crew of 69, 42 members died. The reactor was shut down.*

A special commission investigating the disaster could not establish the cause of the fire. Members of the commission think this can be established only if the sub is raised. The salvage operation is scheduled for summer 1992, and will be conducted by the Soviet Central Marine Technology Design Bureau "Rubin" and the Deep Sea Operations Consortium based in the Netherlands.

The deepness and lack of calm of the Norwegian Sea, the experience of similar American attempts in the Pacific which failed, all raise doubt as to the success of an operation that may cost many millions. Even worse is that the operation may trigger a nuclear disaster comparable to Chernobyl. Strangely, while the media in the West—and especially in Norway—are raising an alarm, this nightmarish prospect is not even discussed in Soviet publications.

An ad hoc commission made up of experts of the Norwegian Nuclear Energy Safety Authority (NES), the Foreign Ministry, Defence Ministry and a number of research institutions of that country has produced a report that warns against possible disaster.

Knut Gussgard, Director of the NES:

The greatest danger is that the reactor could be restarted by all sorts of bumps as the attempt is made to salvage the submarine. It is not ruled out that the vessel may fall apart and reveal its nuclear inwards. There's a possibility

that the graphite rods may shift if the safety mechanisms were damaged during the fire or when the sub hit the bottom. A chain reaction is now prevented by the so-called "toxic" substances that were injected at the time the reactor was stopped. If an attempt is made to raise the vessel, these substances may be washed out by rushes of sea water. If the sub is left alone, corrosion would take at least 100 years before sea water would get inside it.

The sub carries two nuclear-tipped torpedoes. We're convinced that both are well protected. If there are bumps the automatic devices to ensure the missiles' self-destruction might get ruined. This is quite a real danger.

We've repeatedly asked the Soviet side for all sorts of information. Last autumn in Leningrad, and this past February in Oslo we met with representatives of the Central Marine Technology Design Bureau "Rubin" and asked them for proof that could confirm that salvaging the Komsomolets would be safe. We have still not been provided with these calculations.

I will recommend that the Norwegian government protest to the Soviet Union in connection with its plan to salvage the submarine.

Frode Haaland: Leader of the Bellona (Norwegian Greens' Organization):

If the salvage operation is unsuccessful and the sub, whose body is already badly damaged, plunges to the bottom once again, the reactor may restart. This can be prevented by the graphite rods that slow down the reaction. The rods can get washed out as the sub is lifted. And one more thing: according to our information, the sub has two nuclear power plants, not one power plant—and that doubles the potential danger.

The Dutch are saying that the operation would be a success because they are hoping for a big pay-off: the operation's cost is estimated at 1 billion Norwegian kroner (1 U.S. dollar equals 7 N.kr).

Letting the ruined nuclear sub lie on the bottom of the Norwegian Sea is a sad prospect. This is choosing the lesser of two evils. The current at this depth is not fast and the washing out of the nuclear fuel and radioactive substances is highly improbable even if corrosion eats through the fuel capsule, the reactor body and the vessels' two shells. Should there be nuclear leakage when the sub is lifted close to the sea surface, it will poison the more mobile water where plankton and fish live.

Moscow has no right to make a unilateral decision to salvage the Komsomolets. The world public expects Moscow to provide exhaustive information and Moscow is expected to heed all the experts' arguments.

Olav Trygge Storvik, Military News Analyst of AFSENPOSTEN:

No one has yet ever conducted a similar operation successfully. I don't think the most up-to-date technology is going to help. But most important is that there

is a real danger of another Chernobyl. The sub lies in neutral waters and no one can tell Moscow not to salvage it, but nobody has any right to endanger the lives of many thousands of people.

Speaking about the sinking of the submarine itself, I want to remind my readers that saving face and secretiveness on the part of the Soviet military has cost us very dearly. Had they asked Norwegians for help, the number of victims may have been much smaller.

From the editors: We have asked the General Staff of the Soviet Navy for comments. It has been agreed that the designers of the Komsomolets would give their view in the coming issues of MN.

Past Nuclear Testing in Yakutia Investigated

*91P502664 Moscow ROSSIYSKAYA GAZETA
in Russian 30 Jul 91 p 3*

[Unattributed report: "The Secret of a Nuclear Test Site"]

[Text] Once, upon awakening, the inhabitants of the city of Udachnyy, near the Arctic Circle, were surprised to find that the familiar outlines of the surrounding mountains looked somewhat different. Little did they guess that this was not the result of the earthquake, which had rumbled the day before, but of an underground nuclear explosion.

Now the public of the diamond republic is asking: Has Yakutia been a Union nuclear test site in the recent past? How many explosions have been conducted, and for what purposes? What sort of consequences did they have? In particular, a nuclear explosion code-named "Kraton-3," which the specialists referred to as a "genie released from its bottle?" It would seem that the worst fears are being borne out. A commission created at the request of the inhabitants of the northern republic has concluded that the nuclear explosions (there were 12 of them) caused great harm both to humans and to the ecology. They failed to contain "Kraton-3," which shook the upper reaches of the Markh River, because of the weakness of the cement plug in the hole. There was a radioactive release into the atmosphere and the surrounding area and water were polluted. On what territory?

"We are still investigating that," says V. Alekseyev, chairman of the Yakut Supreme Soviet Standing Commission on Ecology. "It is already known that underground nuclear explosions were carried out in Mirninsk Rayon, Tuobuye, and Kyusyur... Of course, since 1978, when they began to bury death-dealing warheads in the ancient land of our ancestors, there has been a significant dilution of radioactive substances. The content of strontium-90 in reindeer meat and beef concerns us.

Excessive Radioactivity Levels Cause Concern in City of Kazan

*OW0108052491 Moscow INTERFAX in English
1830 GMT 31 Jul 91*

[Following item transmitted via KYODO]

[Text] The population of Kazan is fuming over information on radioactivity in its streets discovered last month. The geocentre [as received] of the Moscow Geologorazvedka concern informed the Tatar Republic State Committee for Protecting Nature and the Kazan city council of finding 13 areas in the city with radioactivity exceeding the norm dozens or even hundreds of times—up to 5,000 microroentgen an hour.

Nevertheless, the information was kept secret and leaked into the local press in late July.

The city council is preparing a programme of decontamination of the affected areas.

Swiss-USSR Joint Venture Utilizes Baku Oil Refinery Waste

*LD1607152291 Moscow TASS in English 0747 GMT
16 Jul 91*

[Text] Baku July 16 TASS—A joint venture with a Swiss firm is helping the Novo-Bakinsky oil refinery utilize waste and reduce environmental pollution.

The venture, set up with the Marc Rich Swiss firm treats the refinery's effluents, dumped into the Caspian Sea. The captured oil is then recycled and sold abroad for hard currency.

Marc Rich is now modernizing the plant's old treatment facilities. After modernisation, the venture's profits are expected to double.

The refinery is planning to utilise the oil accumulating on the walls of the oil tanks.

Problems, Achievements in Waste Recycling Noted

PM2407103791 Moscow Central Television First Program Network in Russian 1800 GMT 20 Jul 91

[From the "Vremya" newscast: Report by A. Fedorovich, A. Savin, and Yu. Gvozd, identified by caption]

[Text] [Announcer] Now some news from the sphere of technology plus ecology, or, more precisely, what scientists have accomplished in our country and over there, so to speak.

[Fedorovich] Everything indicates that specialists are paying increased attention to the environmental problems caused by secondary raw materials. Experts reckon that the question of what to do with waste is becoming more and more topical. Industries are experiencing shortages of raw materials, while the dumps are regrettably showing no signs of diminishing.

There have been improvements, admittedly. For instance, conversion is gradually supplying the blast

furnaces with scrap metal. But cutters and presses are no use here. Tanks are not irons and aircraft are not saucers. That kind of scrap is broken up differently. Usually a controlled explosion or plasma energy is used. In a couple of hours the beamed plasma generator—the invention of Moscow's Gorizont experimental design bureau—can reduce the turret of a T-62 tank or the tail of a fighter plane to smithereens.

Take this domestic waste. At present the role of garbage disposal robots, with no consideration for ecologists, is performed by special installations. One of these is arousing business interest. The electronic garbage disposal station—as its technologies are called—is environmentally friendly, and that's the main thing. In a year it munches through 100,000 tons of garbage, producing light and heat in apartment blocks. The superinstallation turns 36,000 ton of garbage into construction materials.

Berlin's KAB Joint-Stock Company engages in thermal reclamation. We point out that for almost 10 years now KAB has worked at important installations in the USSR gas complex.

[K. Beckervordersandfort, member of KAB board, identified by caption, speaking German with Russian voice-over] We are building and modernizing power generation installations. We are prepared to cooperate with you through production sharing and joint ventures. There is good groundwork for this. Many of our specialists have studied and worked in the USSR.

[Announcer] Indeed, what is to be done with waste products. I think that this far from simple problem will have to be resolved in two ways. First, we must develop more modern equipment and technologies on our own and, second, we must cooperate with foreign firms. I would note that our cities and settlements annually produce roughly 300 million cubic meters of solid domestic garbage. We have a special program aimed at developing work in this area. It envisages the construction of 43 plants for this purpose. But the program is geared, like certain others, for the period through the year 2005.

Ufa Chemical Works Officials on Trial for Polluting Drinking Water

91WN0579A Moscow ROSSIYSKAYA GAZETA
in Russian 3 Jul 91 p 1

[Unattributed report: "The Case Comes to Trial"]

[Text] Ufa's Ordzhonikidze Rayon Court has begun hearing the first "ecological" case in the history of the city. The former heads of the ecologically harmful output of the Khimprom Association, A. Salnikov and S. Korvin are the defendants. They are accused of not taking timely measures to prevent phenol runoff into the drinking water reservoirs; this caused massive poisoning of the citizens of Ufa in the spring of last year. More than 1100 inhabitants of the capital of Bashkiria, whose

chronic illnesses became acute after drinking the polluted water, are the trial's plaintiffs. Members of the "Ecology-Health-Life" Association are defending their interests.

Protesters Demand Antipollution Steps at Zaporozhye Coking Plant

PM2207160591 Moscow Central Television First Program Network in Russian 2108 GMT 21 Jul 91

[From the "Television News Service" newscast: Report by A. Uspenskaya, identified by caption, from Zaporozhye Coke By-Product Plant]

[Text] [Uspenskaya] One morning, unexpected guests appeared in the grounds of the Zaporozhye Coke By-Product Plant. Not just anywhere, but right on the plant's chimney stack.

[Unidentified protester] We demand that purification devices be installed, and that existing purification devices be used effectively.

[Another unidentified protester] And also the closure of a coking shop which has been in operation for 50 years without renovation. And the establishment of strict control to ensure that plants which cause pollution pay their fines on time.

[Uspenskaya] You just have to spend an hour in the grounds of the Coke By-Product Plant and your skin and clothes will be covered with a film of coal dust. Incidentally, the Coke By-Product Plant occupies the first place among Zaporozhye enterprises as regards the discharge of dust and harmful substances into the atmosphere. Benzopyrene, a dangerous substance which in large concentrations can cause skin and respiratory tract cancers, is being discharged here.

Well, kids, plant workers are constantly walking past here. What is their attitude toward your action?

[unidentified girl protester] Many of them are very well disposed. They are even prepared to defend us against the militia, against the OMON [Special Purpose Militia Detachment] in the event of any repressive actions. The plant management, on the other hand, has threatened, or more accurately has warned us, that it will not intervene should plant workers try to throw us down from here.

[unidentified male protester] The workers here support us.

[Announcer] The protest action is being carried out in the best Greenpeace traditions. However, despite the vertiginous height of the problem, nobody is rushing to resolve it.

Scientists, Activists Protest Continued Leningrad Barrier Work

91WN0508A Moscow IZVESTIYA in Russian 3 Jun 91
Union Edition p 3

[Letter to IZVESTIYA's editors in the column: "From the Editorial Office Mail: The Barrier Is Being Built Despite the Leningraders' Demands"]

[Text] The planet's tragedies confront scientists with the problem of moral and social responsibility for their actions. Today, ecology has become a field in which this kind of responsibility is particularly important.

The Neva Estuary is on the brink of ecological disaster because of the barrier's construction. Extensive stagnant zones have formed in the Gulf of Finland. Here, heavy metals and carcinogenic elements accumulate in the bottom deposits. The fish are afflicted with tumors, including cancerous ones. The mollusks, which used to clean the water, have died. In the summertime, blue-green algae bloom. Catches of commercial migratory fish have fallen to tenths or hundredths of their former sizes. Among Leningrad's population, illness with viral hepatitis and serous meningitis has become more frequent (especially among children). The resorts on the shore of the Gulf of Finland have completely lost their recreational significance.

The USSR Academy of Sciences Presidium formed a commission (under corresponding member A. Yablonov's leadership) for an environmental impact assessment of the facilities to protect Leningrad from floods. On 12 June 1990, the commission announced the conclusion that the barrier is the main cause of Neva Bay's and the eastern part of the Gulf of Finland's ecological disaster; that its construction must be stopped; that the matter of the Leningrad Oblast party and soviet leadership's legal responsibility for the senseless waste of resources must be examined; that this matter also must be examined with respect to the "Lengidroproekt" [Leningrad Hydraulic Engineering Design] Institute—for an unsound and ecologically dangerous design—and with respect to the "Lenmorzashchita" [Leningrad Sea Protection] Administration—for gross violation of the construction's prescribed conditions.

On 15 October 1990, a session of the Leningrad Soviet of People's Deputies, chaired by Professor A. Sobchak, adopted, by 223 votes to 21, a resolution to stop the barrier's construction and announce a contest for the best plan to eliminate or redesign the barrier.

However, the individuals and departments involved in the barrier's construction are sabotaging the Lensoviet's [Leningrad Soviet of People's Deputies'] resolution, and have managed to acquire further financing in the amount of 40 million rubles for the barrier's construction according to the same design. These elements, striving to justify their actions, and not finding a sufficient number of people having a propensity for the ecological crime among native scientists, have organized an international impact assessment, for the conduct of which 400,000 American dollars have been allocated.

As is apparent from the list, the experts predominantly have been members of the International Association for Hydraulic Research (at the base of which is the Delft Laboratory). In other words they have been people concerned with construction, not with ecology. Moreover, B. Kartelev, director of the All-Union Hydrotechnics Scientific Research Institute imeni Bedenev, who developed the barrier's design, is a member of the soviet

and chairman of the International Association for Hydraulic Research's Soviet National Committee. Therefore, he can influence both the experts' selection and their opinions. Of the 12 experts who attended the presentation, only three have a relation to ecology.

Besides the foreign experts, only party and soviet executives and organizations involved in the barrier's construction took part in the commission's work—precisely those entities about whose legal responsibility the USSR Academy of Science commission had posed a question.

Discussion of the barrier's role in the ecological disaster took place outside the circle of scientists who have specifically studied this matter. On 11 December 1990, the conclusion of the international commission on the barrier's safety and the need for completing its construction was broadcast on television. However, the document did not reach the hands of the scientists.

It is not known who signed the protocol that favored the disastrous situation of people who live in the Baltic Sea Basin: Here, Neva Bay waters, which have become highly toxic, constantly enter. During the routine flooding, the accumulated toxic substances and parasitic flora race toward the Baltic countries (The mechanism of the floods during very high winds consists not only of the water's influx from the sea but also of the water's washing back in the river mouth).

This petition (Its text has been somewhat abbreviated here) was sent to the world ecological community with the request that assistance be provided in conducting an international court hearing, in which the case of the barrier may be examined as one of a crime against the world, the sea, and mankind.

The barrier's construction must be stopped immediately—however, it is continuing!

[The letter is signed by the following: Academician D. Likhachev; chairman of the Leningrad Scientific Center, vice-president of the USSR Academy of Sciences Zh. Alferov; Academician A. Aleksandrov; corresponding member of the USSR Academy of Sciences, doctor of biological sciences Yu. Polyanskiy; USSR people's deputy and writer D. Granin; Academician V. Tuchkevich; USSR Academy of Sciences corresponding member M. Budyko; Academician N. Solomenko; Academician O. Ladyzhenskaya; USSR Academy of Sciences corresponding member S. Igne-Vechtomov; Academician V. Golant; USSR Academy of Sciences corresponding member B. Zakharchenya; Academician L. Faddeyev; Academician A. Takhtadzhyan; Academician G. Golitsyn; Academician V. Maslov; USSR people's deputy, chairman of the Soviet association "Ecology and World", writer S. Zalygin; USSR Academy of Sciences corresponding member A. Monin; chairman of the Scientific Council on Problems of the Biosphere of the USSR Academy of Sciences Academician A. Yanshin; expert of the USSR Supreme Soviet subcommittee on problems of ecology for mankind, Professor N. Moiseyeva; leader of the "Delta" Ecological Association, Writers' Union member P. Kozhevnikov.]

Cyclic Concept of Baltic Sea Ecology Advocated

91WN0554A Vilnius VECHERNIYE NOVOSTI
in Russian 15 Apr 91 p 2

[Interview with Baltic researcher Oleg Pustelnikov by Irena Tishkute under the rubric: "Topical Interview: The Problem of the Baltic—In an Unexpected Light—What Sea Will We Swim in This Year?"]

[Text] *Spring and the approaching summer are forcing us to recall the Baltic Sea, which was in the orbit of enhanced attention from the public just two or three years ago thanks to the Greens movement. The political winds, however, have not had an instantaneous effect on the sea. We became interested in asking the experienced researcher of the Baltic and repeated participant in international Baltic expeditions and programs, Oleg Pustelnikov, what waves are washing the amber shores today, what they are bringing to the beaches, and we found out that this specialist has his own (and, perhaps, unexpected for many) view of the pollution of the Baltic. Here is what he said:*

[Pustelnikov] It has become fashionable to talk about pollution, including the Baltic. All—the public and the specialists talking about this issue—name industry, shipping and urbanization, i.e. man-made influences, as the guilty parties in the contamination of the sea. It is somewhat more complicated in reality.

It is impossible and unnecessary to deny the man-made contamination of the sea. But it is most often of only local significance. Say there are a few "hot spots" in Lithuania: the estuary of the Nemunas, the Klaipeda Strait and Palanga. Not Mazeikiai, by the way, as many are inclined to feel. I carefully studied the effects of the Mazeikiai Oil Refinery on the Baltic for two years. It is less than the effects of Palanga, which has no treatment facilities and where all the sewage effluent drains into the sea.

These and other "spots," of course, have significance for the pollution of the Baltic. An attentive study of the interrelationship of natural and man-made factors in the ecology of the Baltic, however, gives a somewhat different picture. It is felt that petroleum products and heavy metals, for example, are dangerous sources of pollution. But they do not enter the sea and accumulate from ships and industrial facilities alone. It is well known that petroleum (hydrocarbons) are also contained in soils, living organisms, vegetation and the Earth's interior. It is well known, after all, that there are oil-bearing structures on the Baltic shelf, and moreover not just a few. All of this has a great, often negative, significance for the ecology of the Baltic.

[Tishkute] So it turns out that we, as well as other nations, have been sounding the alarm that the Baltic is perishing, that it will not withstand the press of contamination, without sufficient grounds.

[Pustelnikov] I did not want to say quite that. Research data makes it possible to presume that the state of the Baltic and the causes of it cannot be evaluated in such

simplistic fashion. Conclusions can be drawn only by studying a period, say, of 300-500 years. Analyzing it, we see that natural cycles exist in the Baltic that are determined by a host of natural, even often global, factors. The changes in the planet's climate, for example. Why did the merchant's league collapse in the Middle Ages? Because the herring disappeared in the Baltic. And why did they disappear? People, after all, were not polluting at that time.

Today we talk about the terrible pollution of the Kurska Strait. But the disappearance of the eels also cannot be linked to that alone. The pollution is even worse along the shore near Szczecin, but eels appeared there anew two years ago. Not just to serve as a source of hard currency, was it?

[Tishkute] Do all scientists and researchers agree with this new conceptual framework of the ecology of the Baltic?

[Pustelnikov] Understandably not all. But many of the scientists of the Baltic countries are changing their views.

By the way, a book prepared by our Akademiya Publishing House and edited by me on the state of the Baltic and the role of natural and man-made factors in polluting it should be appearing in a few years.

[Tishkute] What would you say, in light of the concepts you have set forth, to those who intend to spend the summer at the Baltic seashore? Will we often learn this year than swimming is banned?

[Pustelnikov] Speaking very generally, the situation in the Baltic is not getting any worse. There is simply an unfavorable cycle right now, determined, as I have already said, by a multitude of factors, and far from all man-made ones.

As for "swimming prohibited," I can say that that depends chiefly on the swimmers themselves. I am relying on observations performed by hygienists. The "swimming prohibited" warnings, you may recall, began to come out only a year or two ago. That is the result of glasnost. But there were always a very great many bacteria in the sea around Palanga and Klaipeda. Especially on hot days. And on a hot day, when as many as a hundred thousand have accumulated to relax on a small section of beach, many of them, shameful as it may be to say, are too lazy to run to the bathroom. The number of bacteria in the water then increases catastrophically, and it becomes less than safe to swim—especially for children.

But the hydrological conditions near Palanga are favorable in general—they have a constant current there from south to north, and the water does not stagnate.

New Gas Drilling Rig Aims To Minimize Ecological Damage

PM3107134191 Moscow Russian Television Network
in Russian 2000 GMT 25 Jul 91

[From the "Vesti" newscast: Report by V. Solovyev and D. Akinfeyev, identified by caption]

[Text] (Solovyev) Gas flares like this one have been burning on the shores of the Arctic Ocean for several years now. For years the earth's resources which we are unable to utilize properly have been burned off like this. The entire shore of the Kara Sea is littered with rusting metal scrap. Disused drilling rigs disfigure the Yamal Peninsula tundra like scars. This is despite the fact that gas extraction on the Yamal Peninsula has not even begun yet. At the moment prospecting is under way. Extraction will begin in 1996. The gas reserves here are incredible—8 trillion cubic meters—enough for more than 50 years. However, to ensure that in 50 years' time the tundra will not have been turned into an ugly desert, we must make sure now that extraction does not damage the environment.

The Severspertsburgaz trust specialists have designed what can be described as the country's first "ecologically clean" drilling rig. [B. Klochkov, deputy director of Severspertsburgaz trust, identified by caption] This is one of the first drilling rigs in our country which is not installed directly on the natural surface, the tundra. Everything here is built on pontoons. We will use ecologically clean drilling fluids and will not cause any damage to the environment. All our rigs come in modules that can be dismantled and taken away at any time.

[Solovyev] Vladimir Solovyev reporting for "Vesti" from the shore of the Arctic Ocean.

Abandoned Cargo, Military Ships Pollute Kola Gulf

OW1807142891 Moscow Central Television First Program and Orbita Networks in Russian 1900 GMT 16 Jul 91

[Valeriy Anuchin video report from Murmansk; from the "Utro" program]

[Text] And now we have a reportage from our correspondent Anuchin: "Ecological Raid in the Kola Gulf." [Video cuts to show ships in docks against a city skyline, Anuchin reporting from the deck of a moving vessel]

[Begin recording] [Anuchin] Good morning. This waterway is linked to the Barents Sea by a strong current. The unique nature of the Kola Gulf lies not only in the fact that it has become the major waterway for seamen and fishermen of the north, but also in the fact that it is the migration path for the semga [northern salmon] on its way to its spawning grounds.

In the fifties and sixties fish were caught here. Some 49 species of fish could be found in the waters of the Kola Gulf. But today there are hardly any fish left. And so, together with the oblast nature protection association, we have decided to take a look at the ecological situation in the Kola Gulf.

We began our raid, which we are carrying out on a motor launch kindly provided to us by workers of the fishing port, from the south of the Kola Gulf. Dozens of fishing vessels tie up at the port or leave it daily. The oil slicks remain on the water after their visits. The fact is that

there are no modern purification facilities on these vessels that are from 10 to 15 years old. The utilized water, mixed with fuel waste, finds its way into the gulf. The largest enterprises in Murmansk are also located on its shores and they dump garbage and waste water into the gulf. [Video shows an assortment of ships, many in need of a paint job, what appears to be a warship in a dry dock, and cargo ships with a massive statue of a soldier on the hill in the background]

Vessels are loaded with apatite at this mooring. Should the wind blow just a little, the concentrate gets blown into the air to land in the gulf's waters. We made a special stop at this mooring, which belongs to the Northern Fleet. Here the Lenvtortsvetmet [Leningrad Reclaimed Metal] Association has been salvaging batteries and polluting the Kola Gulf with sulfuric acid almost with impunity for nearly 20 years. In the past year alone 94 tons were dumped, so imagine the quantity over 20 years. It is reasonable to ask: How have the culprits been punished? The enterprises have been fined, or rather charges have been filed, to the tune of 184,000 rubles. Officials have been fined 1,000 rubles. But what is the cost of damage to the gulf? It is hard to say.

The Kola Gulf has also become a junk yard for decommissioned ships which have become unseaworthy and have been abandoned by the shipowners. [Video shows a row of rusting ships, a semisubmerged submarine, and a vessel painted a military gray] We found this ship at one of the junk yards. It belongs to the Northern Fleet and fuel remains in its tanks, a lot of fuel, and it is escaping into the water through fissures. The Oblast Environmental Protection Committee has repeatedly appealed to the command of the Northern Fleet, but unfortunately this department has failed to react in any way.

Now this vessel—actually you can see only the mast and funnel in these pictures—belongs to the Sudoremontnik cooperative. Due to carelessness it sank at the mooring and its tanks also contain fuel. [Video shows a veritable jumble of hulks and the mast and funnel of what looks like a submerged destroyer, then cuts to show Anuchin interviewing A.A. Glukhov, maritime inspection chief of the Murmansk Oblast Environmental Protection Committee]

[Glukhov] First of all a great deal of damage to the environment is caused by our incompetence. Therefore, the main task must lie in using the developments of science to meet the demands of the contemporary ecological situation. Science must serve the truth. Often our scientific institutions serve the departments to which they are subordinate. Any financing of science by enterprises in accordance with economic agreements ultimately leads to the "I will take care of you if you take care of me" principle.

The second task that the state must solve, at the state level to be precise, is the financing of ecological issues. Presently the state releases miserly sums for ecological problems. It amounts to about one percent. Unfortunately our country does not have any kind of single law for the protection of natural resources and control over

their rational use. Any department can establish its own norms, its own standards, and it verifies them itself. [Video cuts to show a small delapidated orange vessel with booms extended on both sides moving past large ships]

[Anuchin] Of course, I cannot say that nothing is being done to clean the Kola Gulf. Garbage and oil collecting vessels of this kind are at work here. But as we were making this film it was the only one in sight in the gulf. The city is building new purification facilities. The commercial port is taking steps to decrease the dust from the [apatite] concentrates to a minimum. Nevertheless this is insufficient. Money, lots of it, is needed in order to make the Kola Gulf really clean. [end recording]

Chemical, Waste Pollution of Dnepr River Detailed

91WN0530A Kiev MOLOD UKRAYINY in Ukrainian
16 May 91 p 2

[Article by Mykola Mishchenko: "Who Can Drink Up the Dnepr?"]

[Text] As soon as the ship reached the lock and stopped, the adroit sailors threw in their fishing lines. Within a few minutes, there was a good-sized fish in the hoop net. But the lucky man did not rejoice for long: he stuck a finger into his catch and pus trickled out.

"It's rotten!" The angry sailor flung his trophy back into the water.

I looked down and was dumbfounded.

"Do you think you can fish here? The water is not only dirty; it's mutagenic."

The sailors exchanged enigmatic glances. One of them said, "Here it's only half-bad. Wait until we get through the lock."

And sure enough, on the other side of the famous DneproGES, we immediately came upon mud. Hardly anyone, even if gifted with the greatest imagination, would dare call this dirty reddish solution water.

"The whole table of elements is washing up from the bottom," was the comment of those familiar with the river.

Only later did I learn that the famous city of Zaporozhye, the subject of many songs, annually dumps into the Dnepr 137,000 cubic meters of unpurified liquid wastes from various industrial enterprises. There is no need to explain what they are. Biological pollution rots the water, causes its fauna to decay. I cannot understand how the residents of Zaporozhye can look into the eyes of people living in the many large and small cities, villages and towns which rely on the former Slavuta [Dnepr] as a source of water not only for industrial uses but for cooking and drinking.

I did not yet know, for example, that just the waste residue collector of the Zaporozhstal combine alone ceaselessly dumps into the river at least 51 tons of

petroleum products, 2600 tons of heavy particles (dust), close to 113 kilograms of nickel, 1700 of phenol, 1610 of cyanide.

I still had not heard the "justification" of so-called "responsible" Zaporozhye workers, who claim that this is just a drop in the ocean. Why, around the republic, not millions, but billions of cubic meters of liquid wastes that do not undergo any kind of purification are dumped into the rivers. And if I have any doubts about this, I will refer to neighbors whose situation is even worse, perhaps the Dnepropetrovsk Petrovskiy Metallurgical Plant, which until recently was dumping liquid wastes into the Dnepr which exceeded acceptable limits for petroleum products by 400 times, for suspended solutions, by 60 times, for iron, by 10 times. Every year, five million cubic meters of pollution!

Soon I was to learn that some pathetic managers even want to fill up to percent of their water needs from this decayed river. No river in the world has been subjected to such violation!

But that was to be later. For the moment, I recalled the doctors' consultation from the famous comedy: "the patient is more alive than dead," "the patient is more dead than alive," "the patient is neither alive nor dead."

It is sad that I was moved to recall this by the Dnepr-Slavuta, which is not only the main water artery of the republic, but the most important artery in the life of the Ukrainian people.

It is painful to recall what our irresponsible "management" has led to in this oasis of beauty. Of the man-made "seas," we will speak later. For now, in order to confirm how ancient this paradise is, let us recall the great impression it made on the renowned Ukrainian hydraulic engineer, M.I. Maksymovych. In his book "The Dnepr and Its Basin," published in 1901, he was most impressed with the river's tributary, the Pripyat, which teemed with so much fish that if you threw in a spear, it would stick.

The ancient Greek historian, Herodotus, who referred to the Dnepr as the Borysthenes, put it in second place in the world, behind the Nile. And although the Dnepr's water flow is three times greater than the power of the world's longest river, we will not take offense at the words of the chronicle writer. Rather, we will read what he wrote: "The Borysthenes is the richest river: along its banks stretch beautiful pastures for cattle; in it are great quantities of the best fish; the water tastes good for drinking and is clear (in comparison with other rivers of Scythia). The grain fields along the banks of the Borysthenes are beautiful, and where the land is not sown, there is high grass. In the river mouth, there is a huge supply of salt. A large boneless fish, called the sturgeon, lives in the river, and there are many other wonders. . ."

The power of the Dnepr's waters was also praised in the "Tale of Igor's Campaign": "O Dnepr, Slavuta! You have pierced through rocks, mountains. . ." And truly, the river carved its way to the sea through 90 kms of the powerful Ukrainian crystalline shield.

And how wide it was: ("Rarely does a bird reach its center . . .") and how beautiful: ("The Dnepr is beautiful in calm weather").

How can one refrain from singing about the famous river which gives power to more than 35 million people! In the past, people used to sing about it, even in the "Chronicles of Bygone Times." And what about during our own, pre-Chernobyl era? How could we refrain from subjugating such power? The industrial attack to which the Dnepr began to be subjected was not experienced by any other river in a large country. The famous "DneproGES" became the first in an ascending series of powerful electric generating stations. Then gigantic dams appeared near Kakhovka, Dneprodzerzhinsk, Kremenchuk, Kiev, Kanev. Everyone was singing loud praises to the "man-made seas," paying no heed to the fact that so many blossoming villages, fertile lands and meadows rich in hay were flooded, so many graves were desecrated. Even the honest Oleksander Dovzhenko could not refrain from creating the "Poem about the Sea . . ."

They did not know what they were doing. Impressed by the size of the new structures, they did not calculate their costs. If they had taken a pencil and a piece of paper, they would have figured out that if they had used the hay cut on the meadows that were flooded to burn in fuel-burning electric power stations, they would have been able to produce as much electrical energy as generated by the GESs [hydroelectric power stations]. But to burn nutritious hay for heat is a sin! Hay should be fed to cattle, in order to have nutritious meat and milk products. For all of us, for our good health, and not for making almost useless energy for someone.

And what about the "seas"? We even hear that they have destroyed the river's system, established over thousands of years, have slowed down its flow by 5-10 times. It is not for nothing that the common people called them puddles. But this was, in fact, a very mild term, for the people still did not know that the basically-shallow reservoirs would in time be transformed into the "largest waste collectors of the republic." The dirty green opaque water created by blue-green algae has not only destroyed fishing (the plants swallow the oxygen in the water and do not allow any to enter the water from the air), but also blocks up the waste collectors of electrical power stations, the purification systems of other enterprises, the pipes of city water supply systems, the filters of sewage systems . . .

One would think that people would learn something from their mistakes. Not at all! Overenthusiastic irrigation specialists still want to take from the almost-completely exploited Dnepr at least another one-tenth of its waters, which would mean going beyond the river's capacity. Having wasted so much scientific potential, money and materials for the doubtful (right from the very beginning) project of diverting the waters of the Danube to the Dnepr basin, they have now begun to harbor the idea of damming the Dnepr-Buzko estuary. Now what a waste collector that would be . . . the waste collector of all waste collectors! They were dancing with

joy, not because of the ecological sense of this project, but because it is less expensive than some others. But have we forgotten that the miser ends up paying twice?

Yes, the problem of clean, fresh water is probably more pressing in our republic than anywhere else in the country: only in Turkmenia are supplies of it per capita smaller than here. And the use by technology of natural resources is 6-7 times greater in the Ukraine than on average in the USSR. Let us closely consider the following statistics: the territory of the Ukraine constitutes 2.7 percent of total Union territory; we have 18 percent of the population and generate 17 percent of industrial and 22 percent of agricultural production.

Given the present rate of the development of the national economy, by the year 2000, the exploitation of water from all sources will have to be increased by another 16.5 billion cubic meters, for a total of 52.5 billion cubic meters—the whole of the Dnepr!

From where will this water come? At least 6 billion cubic meters of liquid could be saved if we introduced non-waste producing and low-waste production technology and air cooling. And more can be done. In the countries of Western Europe, the water-intensiveness of production is one-quarter of what it is here. Water use could be cut at least in half by using natural, non-cement-bed canals, gutters, by rationalizing the irrigation of fields, in a word, by becoming managers. Then the Dnepr will guarantee reliable supplies of water not for 35 but for 100 million people.

Nature has great power! If only we learned to use it skillfully, and not to destroy it! To approach in a protective, filial manner not only the father of all our rivers, but also every other river, every creek, every pond. Meanwhile, we carelessly and irresponsibly dump 2.5 billion cubic meters of polluted water into our waters. They include 7.3 million tons of polluting substances, including over 6,000 tons of petroleum products, 150,000 tons of organic compounds, 6 million tons of various salts.

It should be noted that we are quoting "official" data here, recorded wastes. What part is this of the true picture? I fear that just the Dnepr alone gets that much, or even more.

Dnepr-Slavutych. I sail on your decayed waters and cannot get out of my mind the wonderful words of the poet: "Who can drink up the Dnepr?" Excuse me, honourable singer of former beauty: nobody will ever drink it now! Few people will even dare to bathe in the pitch-like dirt.

And yet they still bathe.

And they still drink.

Excessive Pollutant Levels Noted in Odessa Coastal Waters

91WN0579B Moscow KOMSOMOLSKAYA PRAVDA
in Russian 29 Jun 92 p 1

[Interview with Nataliya Kovaleva, senior scientist of the Odessa Branch of the State Oceanographic Institute, by A. Milkus: date, place not given: "Fish Die—People Don't"]

[Text] It is said two and a half million people, twice the population of the city, will visit Odessa this summer. But does the pearl of resorts really make vacationers happy?

The Odessa Bay waters are a completely unbalanced ecosystem, commented the senior scientist of the Odessa Branch of the State Oceanographic Institute, Nataliya Kovaleva.

Already at the beginning of June the number of micro-organisms in the sea was thirty times more than usual. Nourished by fecal runoff and waste from industrial enterprises, they develop rapidly. The water warmed up and now they are multiplying even faster. Frosts will begin soon. The amount of hydrogen sulfide in the sea will increase.

In addition, the content of petroleum and petroleum products is two and a half times more than the maximum permissible concentration in Odessa waters; and in the Lyzanovka Beach area, six and a half times more. Polyaromatic carbons (some of which promote the development of cancer), DDT, and electronic and chemical industry waste are considerably above the norm here. There are cadmium, strontium, mercury, and detergents, synthetic washing materials, and phenols. In the coastal zone restricted by strong breakwaters, which for all practical purposes do not permit exchange of waters on the beaches, the volume of dangerous substances is even larger. However, as was explained to me during a special inspection for the protection of the Black Sea, maximum permissible concentrations for chemical substances have been set for fish and marine products. For people this is not so dangerous. "That is to say, fish die, people don't," I asked. Precisely, they nodded in answer.

This week the city health department had to close all the city beaches for swimming. In addition to all the other things, disease-causing bacilli have appeared in the water. A nurse at the formerly popular beach at the Bolshoy Fontan tenth station showed me a notebook in which the complaints of bathers were written down. Itching, reddened skin, the appearance of some kind of strange dark spots, and boils. And, most importantly, no one can really determine the cause of the illnesses, and this also means, cures for them.

The poor vacationers, who spent incredible sums of money to reach the Black Sea, are in a panic. Swimming is forbidden.

Pollution Related Beach Closings in USSR Resort Areas

91WN0579C Moscow ARGUMENTY I FAKTY
in Russian No 26, Jul 91 p 1

[Report by V. Mikhalev: "Exclusive for ARGUMENTY I FAKTY Readers"]

[Text] Today many beaches in the resort areas of our country are being closed, but information as to which

beach and where is contradictory. Could you tell us about this in greater detail?

I. Rib, Belgorod

N. Khitrov, the head of the USSR Ministry of Health Main Public Health-Preventative Treatment Administration Information and Propaganda Department, answered the reader's question for us.

According to information that comes from the health ministries of the Union republics, the sanitary conditions at the country's resort beaches are the following:

Eighteen beaches are closed in the Crimea; in Alupka vacationers cannot go to 9 beaches because of construction and sewage runoff. For the same reason the children's beach in Alushta and the Oreanda beach in Yalta are not open. The Yevpatoria city beach is closed because the local authorities did not finish the organization of public services and amenities before summer; the beach in Feodosiya and the whole Saki coast was not permitted to open for the same reason. More than 20 beaches in the Odessa region are closed—8 of them because of the dangerous condition of the sewer system.

In Krasnodar Kray (RSFSR) the sanitary conditions of the coastal waters of the Black and Azov Seas in the large vacation areas are currently within the limits of sanitary standards. The incomplete state of preparatory work is the reason why a number of beaches were not issued a sanitary certificate. In Latvia swimming is forbidden in the vacation areas of the Gulf of Riga, Jurmala and the Limbazi region in connection with unsuitable water quality. The Bay of Finland coastal beaches in Estonia are open for bathing in the Tallinn, Narva, Kokhtla-Jarve, Kunda, and Khaapsalu regions. The Parnu Gulf coastal beaches in the cities and villages of Parnu, Kabli, and Valgerand are closed due to bacteriological indicators.

As a result of studies of the Apsheron Peninsula southern beaches, a petroleum product and phenol volume exceeding the maximum allowable norm was noted. In addition, in connection with the sharp rise in the water levels of the Caspian territory all the beaches of Baku are flooded with water and permission to operate them has not been given.

Second Edition of 'Red Paper' on Belorussian Ecology Issued

LD2707224891 Moscow TASS in English 1643 GMT
27 Jul 91

[By TASS correspondent Yuriy Bekhterev]

[Text] Minsk July 27 TASS—The second edition of the red paper on Belorussian ecology, brought out recently in the Republic, has been described as an epitaph to the natural environment. 182 types of animals and 214 types of plants are facing the threat of extinction. Ten years ago, when the red paper was prepared for publication for the first time, the figures were 80 and 85.

Lynx, bats, toads, many types of moss, lichen and aquatic plants are on this sad list. It is too late to protect

the middle European forest cat, musk-rat and great bustard. Any effort will be futile.

"The extinction of plants and animals is the payment for excessive enthusiasm over the construction of gigantic industrial projects, ambitious land-reclamation schemes and ill-used chemicalisation of agriculture," Pyotr Lobanok, engineer of the Belorussian Committee for Ecology, told TASS. "This is why the Belorussian Government decided to discontinue investments into major industrial projects. All the investments will be channelled into the retooling of production and the improvement of its ecological safety. Fines for the contamination of water, land and air have been considerably increased."

The red paper helps protect the natural environment. If some type of plants or animals appears on the warning list, its habitat in the forest or the marshy area is turned into a protected zone. The construction of projects or any other economic activities are prohibited there. A total area of natural preserves almost doubled in Belorussia during the past decade. Now it amounts to 900,000 hectares.

"Efforts of ecologists, aimed at protecting the natural environment, have brought first positive results. Sheatfish and European cisco have not been included in the second edition of the red paper, because their population showed a sharp increase," Lobanok said.

Official Looks to Economic Levers for Lithuania's Environmental Program

91WN0534A Vilnius *LIETUVOS AIDAS* in Lithuanian
3 May 91 p 4

[Interview with Rimvydas Andrikis, chief of the Department of Environmental Protection Economics Office, by Angele Adomaitiene: "Commenting on the Law. Respecting Nature Through Taxes,"]

[Text] The oaks and lindens of our homeland have been felled, victims of land reclamation, our lives have been deported to kolkhoz settlements or under smoking monster chimneys. This is more than just tearing the peasant away from the land. The Soviet five-year plans, which brought city and village on an equal level, have also mercilessly devastated Lithuania's landscape and poisoned Lithuania's water and soil with heavy metals, nitrates and other abominations, and the air with sulfates and nitric acids. The environment is polluted, and because of this improper food has already done its part: hundreds of deformed languish in institutions, and cancer and heart diseases have already predominated for a long time. To set environmental protection from its head onto its feet is possible only with an economic mechanism that is normally balanced. This is not easy because the economic management of environmental protection is still only in its infancy. To make production finally submit to the laws of ecology more is needed than good intentions—vast sums of money and advanced technologies. And where is one to get them, when the

budgets of our resurgent state and of the local governments are full of holes? How can economic levers be used to enforce a thrifty husbandry of natural resources and the improvement of the ecological situation? I am discussing these questions with Rimvydas Andrikis, chief of the Department of Environmental Protection Economics Office.

[*LIETUVOS AIDAS*] During the years of "mature socialism" it was fashionable to create various programs of economic and social development, which also reflected the official point of view concerning the protection of nature. At first, no room could be found in them for the protection of nature, and it was only later that it managed to wrest a few lines for itself in the final sections of these programs. In graphic terms, protection of nature received only the last crumbs. Could it be that the economists were unable to comprehend the laws of nature?

[Andrikis] What kind of protection of nature can we speak about, if even the famous food and housing programs have collapsed like soap bubbles? The programs created according to the CPSU instructions were based neither on life's logic, nor on normal economic relations. Only in 1981 did individual sections on natural resources and the protection of the environment appear in the complex programs for scientific and technological advancement. Rather advanced for that time was the complex project for environmental protection in Lithuania (1986-2005). Its data about the extent of pollution astonished many people, because this information had been concealed for a long time. Lithuania found out what danger of slow destruction was threatening it. But there was not much consolation in merely knowing that. The sections of the project, which were prepared by good experts were not in any way related to economic resources. It became apparent that there were not enough funds for the implementation of the project. Hence, progress is impossible without a change in economic relations.

[*LIETUVOS AIDAS*] A half a year ago, an economics office was established in the Department for Environmental Protection. A unit of this kind had not previously existed in our system of environmental protection. What are its functions?

[Andrikis] The main purpose of the office is to incorporate a block of management of natural resources and protection of the environment in the new mechanism of Lithuania's economic administration. After all, we did see a repetition of the old "style" a year ago. Again, no attention was paid to the fact that the economic levers must be reinforced by laws in the areas of utilization and protection of nature. Now we must find the most effective ways how to economically manage the utilization and protection of nature, and to constantly keep perfecting them. The main economic regulatory levers in this case will be taxes on natural resources and the pollution of the environment, a system of prices and subsidies, and economic sanctions. The parliament has already ratified the laws we have drafted, introducing taxes on natural resources and the pollution of the

environment. It is regrettable that the debate on this question is stuck in the Supreme Council.

[LIETUVOS AIDAS] *Why was it necessary to introduce such taxes?*

[Andrikis] We have done so much agitating for the conservation of electric power and resources, and against despoiling nature with wastes. Unfortunately, the ecological situation has continued growing worse and the natural resources have kept diminishing. Lithuania is not rich in natural resources, but we are not conserving even those that are available. For instance, we can be happy about the quality of our aquifer, but it is used to wash the cattle sheds and to clean the streets. Now, when a cubic meter (to be used for technological needs, where aquifer water is not necessary) will cost up to 20 kopeks, we may start saving. Once the rent tax is introduced, that price will go up even higher.

Oil, clay, sand, peat, mineral resources will also be taxed; in the future, one will also have to pay for the use of forests, for hunting trophies, and for other state property. And the taxes for pollution should not cause much discussion: the more you pollute, the more you pay. This is where the machinery regulating production and the market goes into action: the production costs include the cost of the raw materials and of the quality of the environment. They cannot continue rising constantly, because competition and the consumer will not allow that. Either the pollution or the production will have to be reduced. The taxes will be paid into the state or local government budgets, while the fines will be transferred to a state fund for environmental protection. Its monies will be used for the ecology and for the protection of health.

[LIETUVOS AIDAS] *When the above-mentioned projects were being discussed in parliament, the amount of taxes prompted a debate. How were they determined?*

[Andrikis] This was the first time that taxes were being set, and therefore there had to be a debate. For instance, the taxes for polluting the environment were determined by giving due consideration to the level of development of the Lithuanian economy and its technological condition: we are not demanding that enterprises immediately stop exceeding the pollution norms or that they adhere to standards of environmental quality that are being observed in developed countries. Therefore, two normative standards have been introduced—the maximum permissible pollution (MPP) and the temporarily permissible pollution (TPP). The latter will be determined, keeping in mind the existing technology, and will gradually be made stricter until the MPP is reached. These normative standards have made it possible to introduce three kinds of tariffs for pollution—standard, increased, and preferential. They will prompt the enterprises to improve their technology and to reduce production expenses. For instance, the main power station of the Lithuanian Republic (VRE) will pay about 10 million and the Jonava Azotas (Nitrogen) plant, 1.4 million rubles per year. These sums will prompt the giants to take care of the ecology.

[LIETUVOS AIDAS] *Various foreign firms are at present offering their services to Lithuania. Isn't there a danger that our fascination with foreign currency will make us sacrifice our environment?*

[Andrikis] The foreign firms will also be required to undergo an ecological inspection; they will have to pay taxes set by the laws of the Republic of Lithuania and to respect the Law on the Protection of the Environment. That is why I feel no danger in this area. The threat lies elsewhere: which normative standards and which standards of environmental quality shall we follow—the earlier Soviet ones, or the global ones? When foreign firms perceive the possibility of investing in Lithuania, the first ones to knock at our door will be those whose technology cannot effectively compete abroad. Therefore, I take a skeptical view of the rush to respond to any first offer. There should be no haste without first having heard the experts' findings. We must move as quickly as possible to the adoption of global environmental quality standards, so that several years later we will be spared having to spend ten times more money for cleaning up new sources of pollution.

[LIETUVOS AIDAS] *In your opinion, as an economist and as a champion of environmental protection, which industries in Lithuania should be developed and which ones should be eliminated?*

[Andrikis] I think that the introduction of taxes for the pollution of the environment and for the use of natural resources will help us to find a rational solution, because the costs of production will reflect actual expenditures and consumption. We must pay attention to all that as we proceed with the price reform, because the production costs of such basic branches as the power or the chemical industry must encompass all the production expenses, including those caused by pollution. I disagree with opponents who are saying that the taxes will have a negative effect on producers and consumers alike. Their effect can be only positive: when we pay for the real value of every item or service, then we will know what and how much Lithuania must produce and consume. The future economic structures and directions must, of course, already be anticipated now. We must depend as little as possible on the raw materials of our eastern neighbor and we must expand those sections of our economy that require a greater intellectual input and to consider the use of geothermal, wind, solar and other non-traditional energy.

[LIETUVOS AIDAS] *What is the greatest obstacle in setting environmental protection on its feet?*

[Andrikis] First of all, it is the unwillingness or the inability of the directors of some enterprises and agencies to undertake essential reforms and to change the Soviet mind-set. The shortage of instruments, equipment and funds is, after all, common to all areas of the economy. It is time to understand that we shall not improve the condition of the environment by merely removing the results of the pollution. We must also remove the causes, to introduce higher quality technologies and to devise new instruments. I am an optimist,

and I believe that it is possible to create an essentially new system for managing the utilization of natural resources and protecting the environment. When some enterprises, in their effort to survive, are compelled, for instance, to take care of the instruments, and others, to manufacture them or to introduce new technologies, then the problems will slowly diminish.

[LIETUVOS AIDAS] Your optimism is certainly conditioned by your youthful age and by the experience in protecting the environment you have accumulated at the Institute of Economics. I most sincerely wish that you will not lose it.

[Andrikis] Thank you.

Above-Normal Radiation Levels in Latvian City Attributed to Military Radar Installation

*OW1907093591 Moscow BALTFAX in English
1500 GMT 18 Jul 91*

[Following item transmitted via KYODO]

[Text] Lately the sanitation and epidemics authority in the city of Liepaja measured electromagnetic radiation in the city and found its level is two to three times higher than the admissible one, apparently because there is a radar in the city's southern suburb.

The City Hall has repeatedly approached the command of the Baltic Military district, the USSR Defense Ministry and the General Staff of the USSR Armed Forces with requests to close down or relocate the radar, but all the military did was install a metal screen around the installation.

Environmental Pollution in Estonia Surveyed

*91UN2127D Tallinn RAHVA HAAL in Estonian
14 Dec 90 p 2*

[Article by Prosecutor Laine Mikenberg: "Assorted Data Regarding Environmental Pollution in Estonia"]

[Text] City and district prosecutors, along with pollution control agencies, ran a check on how well the environmental protection laws are being implemented. Not too well, it turned out.

For years, we have been violating laws that regulate the use of earth, water, air and fishing rights, without taking note of or understanding the extent of the damage. It is only recently that we have begun to comprehend, that the situation is bordering on critical: The air surrounding us is full of harmful gases, many regions are running out of clean drinking water, fish are dying in our lakes and rivers, etc.

Ignoring existing laws has resulted in extensive pollution damage to the ground. In agriculture, the greatest polluter is a poorly managed manure economy. Many of the collectives in the Lääne, Järva, Pärnu and Rapla districts and on the island of Hiiumaa don't have any manure pits at all, or whatever they do have is not functioning. By the same token, the pit at the Tolkuse piggery of the Häädemeeste kolkhoz in Pärnumaa is also not up to code. The

ditch running along its border, and the land around it has become one general storage area for manure. The area around the Anari farm of the Kirna kolkhoz in Järvamaa, where great quantities of unremoved manure are endangering the Lintsi River, is polluted in the same manner.

There are other such cases that could be cited. In fact, these have become so commonplace that no notice is taken of them until some environmentalist comes and points them out.

Fertilizers are handled just as poorly. Storage requirements are not met, areas around storage facilities are polluted with hand-applied fertilizers, empty fertilizer containers are everywhere. A severe breach of law occurred at the Tuudi kolkhoz, where fertilizer that had seeped into the water wound up in the Bay of Matsalu.

Ignoring regulations for the storage of poisonous substances can also lead to trouble. Over a period of time collectives have accumulated several prohibited plant-treatment chemicals that are no longer usable. For the collectives of the Western Viru district, for example, this added up to 18 tons. The Tallinn storage facilities of the Põllumajanduskomplekt [Agricultural Complex] held, in violation of regulations, over 19 tons of unusable substances. In the City of Jõgeva, the local EPT has for some years been storing poisonous substances in containers that are not up to standards. The storage facility was liquidated by order of the district prosecutor's office. At the time of the closing the facility held 3.35 tons.

Particularly hazardous are production residues containing toxic substances. Many enterprises have been taking such materials, in violation of regulations, to dumping sites and natural areas. Thus, between May of 1989 and June of 1990, over 15,000 fluorescent lamps containing mercury compounds were taken to the dumping site from the Narva furniture factory, the Kreenholm textile manufacturing plant, and the Baltic thermal electric plant. So far, we have not yet been able to solve the problem of how to render harmless, store and utilize the toxic substances, and that's why they are still being taken to the dumping sites.

The ash-mounds of the thermal electric plants in the Eastern Viru district take up over 2,000 hectares of farm and forest land. They contain millions of tons of harmful substances, and continuously pollute the earth under and around them.

A lot of damage has been caused by careless handling or transfer of crude oil products. Due to carelessness, some 9,200 kg of black oil were spilled at the Tartu meat combine, and 46,457 kg of gasoline at the Võru crude oil base. At the Haapsalu military airfield, the 2.5 km long fuel pipe has been leaking for years.

Pollution of the ground inevitably leads to pollution of both surface and ground water.

The hazards to our surface bodies of water are increased further by industrial enterprises that for lack of purification equipment or because of its poor technical condition, dump their effluent into the city system.

The condition of our rivers, lakes, and seawater has deteriorated. Many of the rivers—Keila, Vääna, Purtse, Raudna and Kohtla—are polluted. Kroodi creek is particularly hard hit where, in July, concentration exceeded the allowable limits 12.3 times for sulfates, five times for iron, four times for phenoles, four times for crude oil products, and 6.6 times for ammonium-nitrogen.

In Tallinn, the biggest polluters of seawater and air are the cellulose and paper factories. From these two, some 10 million cubic meters of water polluted with crude oil products, phenoles, sulphates and other substances are dumped into the sea annually through the sewer system. Severe pollution of seawater also comes from Eesti Fosforit [Estonian Phosphorite]. The oil shale chemical industry of northeastern Estonia is another polluter of seawater and surrounding bodies of water.

In the summer of 1989, the water in the Bays of Pärnu and Haapsalu was so polluted bacteriologically, that swimming was prohibited at nearby beaches. Since the situation showed no significant improvement this year, swimming was still not recommended for any of the sea beaches in the Pärnu district, except Kabli.

The situation is bordering on critical in smaller cities and townships (Kuressaare, Otepää, Mustla, Kehra and Keila-Joa), where there is no purification equipment and effluent is released directly into the rivers or the sea.

Due to the pollution of surface waters, some places in Estonia have no drinking water left. The water from the wells of Tapa and its surrounding area has not been fit to drink for years. The latter was rendered unusable by the military airfield near the city, where crude oil products have been seeping into the ground water for years. The water is also not fit to drink in the wells of the Raadi section of Tartu, where it is polluted bacteriologically. Supplying Tallinn with water has also been a problem.

Air pollution control has become a necessity. The 224 industrial facilities of the republic have, over a nine-month period, discharged 387,700 tons of pollutants into the air (4.4 percent more than over the same period last year). The amount of pollutants emitted had increased for every fourth facility.

The air is bad in northeastern Estonia, where poisonous gases are being emitted from three oil shale chemical factories, two large thermal electric plants, and oil shale mines. The Baltic and the Estonian thermal electric plants alone emit 300 tons of harmful substances a year.

The city of Kunda and its surroundings are being polluted by the cement factory located there, which accounts for annual emissions of 55 tons of cement and oil shale dust and soot, and 14,000 tons of harmful gases.

Exhaust fumes from cars are polluting the air in Tallinn and other bigger cities.

The pollution of ground, water and air also has an adverse effect on our fish and forest economy. Some species of fish have died out in our inland waters. In the lakes of the Põlva district, only 19 species are left out of 25. In some rivers (Purtse, Kohtla) there is no life left at

all. In many parts of the Gulf of Finland vegetation has disappeared, so there is no place for the fish to spawn. The condition of the forest has been deteriorating with every passing year. Due to the long-term effect of the sulphur compounds, the evergreens are losing their needles.

The general pollution of our environment also has a deleterious effect on the health of our people. Morbidity is well above the average for the republic in the heavily polluted areas.

The prosecutor's office, along with environmental control agencies, have tried to identify the polluters, make them accountable, fine them for damages caused, and require them to remove both the causes and the consequences of such pollution. The prosecutors have warned many officials against the results of violating these laws and demanding, in their missives and regulations, that their harmful activity be stopped. Some criminal actions have also been brought against them.

One must concede, however, that the situation cannot be improved by administrative measures alone. To establish facilities and equipment for environmental protection, we will be needing more money, materials and technical assistance than ever before. These must be found by both the enterprises and local administrative authorities themselves.

Goals, Work of Estonia's Greens Movement Outlined

91WN0508B Tallinn VECHERNIY TALLINN
in Russian 16 May 91 p 2

[Article by Yuri Khunt: "The Capability of the 'Greens'"]

[Text] Many are asking themselves the questions: What is the "Greens' Movement"? Is not the DZ [Greens Movement] devoting too much attention to politics? etc. In this article, the author is not trying to give definitive answers, but, inasmuch as he was a participant in the debates concerning the DZ's activities, he is competent to make a synopsis of what is happening and provide a personal evaluation.

Political Disagreements

The nature of the relationship between politics and the "Greens" became evident during the so-called phosphorite war, when the DZ was only beginning to form. The movement's original purpose was just nature-protecting actions, but the movement quite rapidly turned into a political one and became one of the vital elements in the struggle for freedom. From this, one may make the prime deduction that, in our era, protection of nature and the environment affects many different people and organizations to such an extent that, like it or not, activity in the field becomes political to some degree.

In order to clarify the causes of its disarray, it is necessary to go back to the DZ's origins. In the author's opinion, there were principal disagreements even in the

founding group. Subsequently, several politicians (Made, Aare, Pokhla) and figures of lesser caliber rose from the Greens' rank and file. Some thought that it was necessary to use other means to protect nature. Having united, the people were delighted that, at long last, they might engage in something, the initiator of which was not the KPE [Communist Party of Estonia].

However, troubles began from the very outset. The individual politicians' interests did not coincide. Each of them was an individualist and held to his own course, and the movement yawned on the waves, like a ship that has lost steerage, because the other members were far from the helm. This turned out to be the cause of caustic debates at the DZ's next mass meeting. This article's author also took part in a debate. As a result, democracy won a victory: Strict control, on the part of a council, was instituted over the leadership and governing board. The condition for making authoritative decisions was stipulated: No fewer than two-thirds of the members of the council, to which 54 persons were elected, must be present at the council session.

The consequences of democracy's having won out began to be felt immediately: Elections to the DZ's governing board proceeded with great difficulty. As a result of the discussions at the mass meeting, Tiyt Made did not get on the governing board. However, he himself and his supporters were unable to accept this situation. Inasmuch as Mr. Made also had supporters in the council, proposals not conforming to that clique's interests became prey to a purely Madean demagoguery. The council's meetings turned into debates between this clique and the rest of the members. By that time, the even-dispositioned and aloof Yukhan Aare already had practically taken leave of the DZ (He was at an educational institution abroad for professional improvement, and devoted himself to politics thereafter). Among the politicians in the DZ, Vello Pokhla and Toomas Frey remained. Because of the numerous demagogic debates, many worthy men willfully stopped participating in the work in the council, and only three times was there a quorum. Management of the movement passed into the hands of the governing board and its chairman, Toomas Frey, who performed his functions with varying success.

A Director Hired

At the DZ's last mass meeting, it was noted that democratic management had functioned divisively. The governing board and a salaried director now manage the movement. The leaders of territorial contingents and working groups, or the delegates of these, are included on the governing board. Decisions are made by majority vote of those in attendance at a governing board meeting. The lesson in democracy has produced favorable results. Senseless debates no longer occur.

Anyone May Become a Movement Member

In speaking of the DZ, it is necessary to state both the movement's purposes and the means of accomplishing these. By comparison to other parties, the "Greens" find themselves in a unique position. They are not striving for

power in order to improve the well-being of part of the people or all mankind, but, on the contrary, they are willing to forgo blessings already won for the sake of saving life, and they urge others toward this. For this reason, the DZ will never become the party in power. However, there must be an opportunity for it to have its say in the settlement of issues. On the other hand, it is difficult for the exponents of different views to work together. This is easier done among movements than among parties. All people, without regard to their party affiliation, may participate in the "Greens" Movement." Doing so does not mandatorily obligate them to support only the candidates from the "Greens" in elections, but just candidates to represent the DZ's interests.

The 'Greens' Party

On its face, the "Greens" Party is a component of the DZ, but, in fact, it differs strongly because only those who are not members of other parties may join it. To avoid misunderstandings, a notation of his desire or lack of desire to become a member of the "Greens" Party is made on the DZ member's membership card. Thus each DZ member has a choice, but, upon joining the party, additional obligations are imposed on him. Not all of the deputies elected from the "Greens" are members of the "Greens Party." This fully conforms to the DZ's charter, according to which candidates from the movement need not be members of the party.

An Apple of Discord

With this, it would be permissible to end the familiarization with the DZ. It remains only to tell you that an apple of discord between the movement and the party has appeared. Back at the "Greens" first mass meeting, it was stipulated that a party might arise on the basis of the movement. Appropriate preparation for this was in progress. But suddenly, like a bolt from the blue, there rang the report that a group of the "Greens," headed by Mario Kivistik, had declared itself the "Greens Party" without having made the DZ's leadership aware of this in advance.

The ruckus might have been somewhat less if the new party's members had been more discrete and named their party something else; for example, the Environmental Party. Members of the new party were on the DZ's governing board and knew about the intentions to form a party, but they ignored these. On the other hand, other members of the DZ's governing board expressed themselves quite rudely in the press regarding this. The principle, do not be hurtful, was violated. These actions brought success to no one, but they inflicted considerable damage on the movement.

Despite the difference in platforms, relations between the movement and the party have somewhat smoothed out lately. However, everyone's grievance has remained, and misunderstandings sometimes arise. For example, it was only from the foreign press that the DZ's leadership found out about the PZ's [Greens Party's] intentions to hold an international conference....

Who Is Greener?

The relations between the party and the movement have already been discussed more than once. I do not wish to repeat myself on the theme: Who is greener. There would be benefit from debates only if the political competition were based on a legal foundation. There is little benefit in criticizing each other.

One may say much about the "Greens" and the environment. However, let us sum things up: The difficult formation stage is over. There is much work ahead. In Tallinn, you may communicate with the DZ on work-days from 1400 to 1600, on telephone number 68-17-13, or you may come to the address: 11-s Sakala St. (behind the conservatory construction site). At the same place you may sign up for DZ membership. The "Green Contingent" (8 Viru St., tel. 44-83-55) unites young nature lovers.

Ecological Damage Caused by Nagorno-Karabakh Conflict Assessed

91WN0559B Moscow *PRAVDA* in Russian 24 Jun 91
Second Edition p 8

[Article by *PRAVDA* correspondent Z. Kadymbekov: "Bad for People, Bad for Nature"]

[Text] Baku—The State Committee for Environmental Protection of the Azerbaijan Republic has issued a statement that makes an attempt, perhaps for the first time in the almost four years of conflict, to analyze the situation that has taken shape in the Nagorno-Karabakh

Autonomous Okrug and the regions bordering Armenia from ecological and environmental-protection standpoints.

What harm has been done to nature by the combat operations, bombings, explosions and fires as the result of the undeclared war that has been unleashed on the territory of the republic? The document notes that starting in 1988, when an attempt was made to destroy the Topkhana historical and environmental monument near Shusha, more than 10,000 hectares of arable land and perennial plantings have been removed from agricultural circulation. The damages total some 220 million rubles therein, and that is without counting the value of the agricultural output that could have been grown on that territory.

About 600 hectares of forests, or more than 300,000 trees, have been destroyed, many of which were recorded in the Red Book of the USSR and the republic. As for the fauna—one and a half million rubles; thousands of game and Red Book wild animals and birds have been destroyed. Research and analysis of sources of water shows that the intentional pollution of rivers with discharges of industrial and municipal effluent has increased compared to prior years, and many of these rivers, after all, supply the population with drinking water. The activity of some of the preserves and game reserves has virtually been paralyzed as the result of shootings, seizures of territory and attacks on workers of the environmental-protection services.

The leaders of the republic's Goskompriroda [State Committee for Environmental Protection] have appealed to the Supreme Court of Arbitration of the USSR and the Procuracy of the USSR with a request to render assistance in compensating for the damages inflicted on nature in Azerbaijan, and holding liable those who are guilty.

REGIONAL AFFAIRS

Nordic Countries To Cooperate on Hazardous Waste

91WN0610A Stockholm DAGENS NYHETER
in Swedish 20 Jun 91 p 10

[Article by Bjorn Jerkert: "Nordic Cooperation on Hazardous Waste"]

[Text] The question of the future of environmentally hazardous waste will be studied by a new Swedish-Norwegian company, according to a new decision by the government. At the same time, municipalities and companies are offered the opportunity of purchasing large parts of Sakab.

This was the finale to the long story that Sakab 2 was going to be built somewhere in Sweden because the facility at Kumla was not considered sufficient. But no municipality wanted to accept the waste and a proposal to send it to Norway came up.

According to the proposal which was submitted the other day, the two countries are now to form a new company. This is not for the purpose of building a large, joint facility in Norway and having hundreds of millions in capital stock, however. Instead, the company will only investigate the need for treatment and study various techniques, locations, financing and organizations, and the capital stock will be a modest 20 million kronor.

The Threat Gone

It was also determined that Sakab in Kumla will remain, be utilized to the maximum and be further developed.

This pleases both the company management, the unions, the provincial governor and the municipal council, which regarded the Norwegian plans as a threat to Sakab and protested. The company has about 100 employees today.

There has also been criticism from member of Parliament Per-Olof Hakansson (Social Democrat), who studied, negotiated and pulled all the strings. In the new company it will not be politicians but the executive managements of Sakab and its Norwegian counterpart which will be in control.

The reason why it no longer appears that a new, large combustion plant in Norway is needed is partly the fact that the amount of waste has decreased drastically, and partly that new ways to deal with environmental waste have been developed.

Norwegian Waste

According to managing director Sune Lundgren of Sakab, it is now likely that a treatment combine will be built in Kumla at a cost of approximately 50 million kronor and a two to three times larger combine in Norway. Here the waste will be treated in an environmentally more favorable manner, and there will also be room to burn some waste from Norway in the ovens at Kumla.

Previously, plans had been made for new facilities both in Sweden and Norway at 500 million kronor each. Cooperating, specializing in various types of waste and dividing it up results in major advantages, not least financially, the government writes.

New Owner

The government also wants to bring new owners into Sakab, of which the state today owns 96 percent. The company also has contacts with the gigantic U.S. Waste Management company and with Swedish Cementa, which has developed new techniques for handling waste without burning it.

Sune Lundgren believes there is interest on the part of ABB [Asea Brown Boveri] and other large companies as well and from municipalities which are active on waste issues. The government also wants to include the other Nordic countries in the new company.

DENMARK

Environment Minister Discusses Policy Goals

91WN0587A Copenhagen BERLINGSKE TIDENDE
in Danish 16 Jun 91 p I 4

[Article by Henrik Schultz: "A Danish Green Autumn"]

[Text] Danes will know in a few months how large the environmental problems are in Denmark and also in what order the legislators will solve them, says Per Stig Moller. Autumn can be the beginning of a well-ordered and balanced environmental debate.

One can see them in Slotholmsgade early in the morning: Casual types in cowboy apparel who glide past the stock exchange with their small backpacks.

It is a sight designed to keep a few North Jylland proprietors awake at night. For the people in Slotholmsgade are not the Latter Day Saints on their way to the island camp 'Aftenrode'. They are bureaucrats on their way to work. They are on their way to a ministry which has the most magic and powerful word of the 1990's in its name: Environment. A ministry that in coming years will influence Danish lives with increasing intensity.

They know well enough in there that they have a PR problem. Wagging tongues have long maintained that they are just some old hippies who leak everything to the press and the minister's political enemies. But people will say anything, so one has to be content with realizing that the Environment Ministry in Slotholmsgade No. 12 is something unique unto itself: the Foreign Ministry's diametric opposite. There is nothing stiff or Germanically formal about the Environment Ministry. It is Danish and totally without form. Right to the marrow. "Hey, wait up, here comes Per," says a young man in green shirt and sensible shoes out in the hallway. It is not an assumed informality. That is how people talk here—and are happy with it.

"Per," son of Poul and also known as Minister of the Environment Per Stig Moller receives in a small office

decorated with a large map showing "Denmark's soil types" and small engravings of Danes in folk dress. There is a great deal to rejoice about this particular Monday. The raven nests once again in the Sjaelland wood just as Karen Bixen described in her novels of the 1930's. And it is going extremely well for the cormorant, which was at one time an endangered bird. Now, in tight formation, it has settled in to bomb Horsens Fjord back to the stone age. And today, Monday, the minister is on the front pages of both BERLINGSKE TIDENDE: "Ban on Water Scooters" and POLITIKEN: "Danish Industries Ahead in Environmental Sphere."

Report on Danish Environment

It is nice to be the Environment Minister in June 1991, but in August it could even be better.

"In August a report from the Environment Ministry on the status of the natural environment in Denmark will be released," comments Per Stig Moller and lights his indispensable pipe. "A work of hundreds of pages. From this report we hope later to draw out some indices—key figures—which can be updated from year to year. From these figures—20 or 30 numbers—people can see whether we are getting an environment for the money: Is lakewater becoming clearer? Is the number of endangered species growing larger or smaller, etc? A priority plan will accompany the report. It is a plan in which I suggest some areas to the parties in the Folketing where we should take action in the next ten years. If all goes well, we should by autumn have a situation whereby the population has a precise picture of the extent of the environmental problems and in which order the legislators will tackle them. We will probably discover that it will take a long time to restore the environment. People can become impatient if we use billions of kroner on an issue without the key figures changing. But we must remember that it took us 50 years to make the mess. It takes time," Per Stig Moller says and warns against "the impatience that is seen in connection with agriculture, where some would rather break the back of it than ensure that it is headed in the right direction and provided with an additional two years."

Freebooters Onboard

And now the pace steps up. The pipe is puffing away: The conversation turns to those Per Stig Moller alternately calls "freebooters" and "pirates."

"I formed a task force in February with people from the Finance Ministry, Tax Ministry, and Environment Ministry. The object is to study environmental fees and to consider them in relationship to other excise taxes. That is what they need to do. In this way they will get an impression of their effect and whether they are being applied to the appropriate areas. We have run up against 'pirates' who jump in and put through a fee wherever they feel an inclination. They don't put environmental fees in perspective. If you begin to set up environmental fees here and there without putting them in perspective, you risk setting them up where they are least important."

Danes are already living in a society where "the fees of the future"—environmental excise taxes—play an increasing role: Fees for dumping, which were estimated to bring in 500 million kroner, yielded 413 million in 1990. Fees for chemical insecticides brought in 11 million kroner more than estimated, while fees for CFC [chlorofluorocarbon] gases yielded 28 million kroner, but was expected to yield 80 million kroner. Can the nation's revenue increasingly be based on fluctuating environmental fees?

Environmental Fees—Not New Taxes

"I am in favor of environmental fees—they are a liberal type of control. They do not forbid people anything, they just make one thing more expensive than another. And so, people may choose," says Per Stig Moller, who with many others foresees a growing importance for such fees. An excise tax which will ease indirect taxation and maybe also direct taxation.

"But we must not use such fees as a substitute for taxes. They should be used to encourage or discourage people from doing something. You cannot base health and social institutions on fees that suddenly fluctuate by 50 million kroner. We must be cautious. For if people behave sensibly, not a single krone will be paid in. You will start to lack funds if people behave sensibly, and if you have already lowered other taxes, the next stage happens: It becomes necessary to raise environmental fees even higher. You use the environment as an instrument of taxation—and create a colossal aversion to environmental policy," says Moller, whose staff is about to investigate fees for packing materials in order to see whether they are environmentally justifiable. Particularly charges of 10 ore per milk carton have been criticized by environmentalists. The fee was introduced in order to inspire a reusable bottle, but this—or another alternative consumer product—has not shown up.

The man who invented the Conservatives' environmental slogan: "Take good care of Denmark—it is worth preserving," has now been nature captain for a half year. With his assumption of office, the parting minister, Lone Dybkjaer, gave him some good advice: "Do as I would have done and you won't have any problems." The parties outside the government managed to put through a CO₂ fee before the summer recess. Is it the "freebooters," the alternative majority, that is deciding in what direction the green boat is to sail?

The Alternative Majority

"Look at the legislation that has passed," says Per Stig Moller. "The Environmental Protection Act passed with the government, the Social Democratic Party and the other nonsocialist parties minus the Progress Party. The Plan Act was passed by all of the non-Socialist parties. Where is the alternative majority? The Raw Materials Act? Passed by the whole Folketing. I said in the Folketing that I see several alternative majorities—but the government is part of them all. The alternative majority does not exist—but that is not to say that it cannot arise. 'The alternative majority' has only made its

mark one time with the Nature Protection Act, which the Social Democratic Party, the Socialist People's Party and the Christian People's Party got postponed. Consequently, an improvement of the environment is postponed. I would not call this majority alternative, but rather, destructive. It made its mark one time—and it was destructive. But, in fact, I am hoping for good cooperation in the autumn. If we can get a list of priorities formulated, establish a pace for restoration of the natural environment, and if we can nail down principles for environmental fees, we will be truly on track. And we can avoid alarmist solutions."

Alarmist solutions and freebooters are clearly Per Stig Moller's favorite words this Monday morning. But who is it actually who controls the environmental debate and the ensuing alarmist solutions in Denmark?

"It is the media and popular fears. It is not the environmental experts. My experience after six months as minister of the environment is that it is not here that the environmental extremists are found. These are level-headed people. It will surely surprise people that I say this, but such is the case. The media play on people's fears. The environment has become the big threat now that we no longer have the nuclear threat. Often the environmental threat is real, but just as often we react against things that are least significant. Take for example asbestos. Our best researchers said: 'Let it stay where it is, it will create bigger problems to remove it.' But people's fears drummed out these quiet researchers, and the removal cost us a gigantic amount which we could have used much better for other things."

"The report we are working on concerning the condition of the natural environment will bring order into the whole. We will avoid 'today's shock.' The information on the environment in the press will be relatable to a background which people can find in the report. If one looks into the files of the Environment Ministry, one can see that former environment minister, Christian Christensen, had already worked with the pollution of the Kattegat long before 'the 12 lobsters' and David Rehling popped up. People simply did not realize that. I hope that in the future people will see that issues do not sneak up on us. The report on the condition of the Danish natural environment can be used for public information and to dispel unnecessary anxiety."

Less Power Is the Issue

A new plan law has cut down the ministry's power in the districts and municipalities. He is very happy about this:

"People use me to avoid solving a problem locally. Take, for example, refuse dumps. Districts and municipalities never agree. And so I become the 'bad guy' who comes and puts in a waste disposal site. There is a lot of shifting of responsibility in this, and the legal complications are enormous. Five days a week I spend in meetings, and on the weekends there are up to 16-18 hours of paperwork. It is a heavier burden than I had expected," says Moller, who must now begin the day's meetings and prepare

himself for the afternoon's "environmental restoration excursion" to Vigelso in Odense Fjord.

There are many legal cases on file. And many pages have to be turned before the Danish green autumn begins.

Sale of State Forestlands Opposed

91WN0587B *Copenhagen BERLINGSKE TIDENDE*
in Danish 21 Jun 91 p 10

[Editorial: "What the Forest Reflects"]

[Text] What the state has, the state keeps. With this antiquated platform as a point of departure, SF [Socialist People's Party] and the Social Democratic Party are trying to halt the attempt to turn the state's forest reserves into cash reserves. The planned sale of state forestlands is minimal in comparison to total forestlands in the state's possession. Nevertheless, the outcry is tuned up to a high ideological pitch.

SF's environmental spokesman, Steen Gade, understands well enough that the state cannot be innkeeper, hotel owner, and camping grounds concessionaire. State-owned inns and camping grounds may consequently be sold to private interests, even though SF's blessings are hesitant and bestowed with a whisper. But when it concerns forests there is immediate and loud rejection.

An odd attitude when one realizes that forest ownership is beset with every possible restriction and directive concerning the pace of tree-felling, reforestation, and official access. In fact, SF should thank everyone who accepts the task of being a private forest owner and who is willing to invest large sums in an uncertain future. It is peculiar that a Dane with a desire for wooded land must go to Sweden or to former East Germany to get permission to buy publically owned forestlands.

Steen Gade thinks that the biggest forestland problem in Denmark is that private interests are reluctant to plant new forests. What do you bet Steen Gade is familiar with the tax regulations which make it excessively expensive to plant deciduous trees? Cheap pine trees are regarded taxwise as crops and can, like grain, be written off. The expensive deciduous trees cannot be, and on top of that, it is usually the heirs who will reap the eventual profits. Therefore, it is not so surprising that Danish forestlands are, from the point of view of ownership and species, a reflection of ideology and tax legislation.

Farmers, Environmental Groups Debate EC Directive on Spraying Agents

91WN0587D *Copenhagen BERLINGSKE TIDENDE*
in Danish 21 Jun 91 p 8

[Unattributed article: "Support for Directive on Spraying Agents"]

[Text] Agricultural organizations say yes to the controversial EC directive concerning approval of spraying agents, while environmental organizations fear that 10 years' environmental work will be lost.

Agricultural Minister Laurits Tornaes (Liberal) has the full support of agriculture to accept the EC directive which will allow free movement of chemical spraying agents.

The Folketing's market committee will decide on Friday what authority Laurits Tornaes will have at next week's meeting of the EC's ministerial council where the directive on spraying agents will be dealt with. The environmental organizations have collectively appealed to the market committee to force the minister to veto the directive.

Vice chairman Axel Ladegaard of the Danish Agricultural Associations:

"We are not especially worried. Those who work on the issue on the EC level are responsible people, and I doubt that the EC would approve methods that damage the environment. Fear of the directive is grossly exaggerated."

Threat to Vital Environmental Interests

Greenpeace, Noah, and Denmark's Nature Conservancy Association state in a collective declaration that Danish environmental regulation of spraying agents will be put back 10 years if the directive is adopted. The organizations believe that vital Danish environmental and health interests are threatened by the directive.

"It is possible that Denmark will be forced to accept between two and three times as many spraying agents as are approved today.

"This includes substances which are prohibited in Denmark" because they are regarded as being carcinogenic, the environmentalists' memorandum to the market committee states.

The organizations fear that the major work of recent years in Denmark of weeding out the most environmentally and health hazardous spraying agents will be lost.

The agricultural organizations have shown themselves to be amenable to the Environmental Board's reevaluation.

Their dissatisfaction centered on the fact that the work of approving new and more environmentally safe spraying agents has proceeded too slowly.

No Fear of the Directive

Axel Ladegaard of the agricultural associations is supported by other organizations in the trade who also have no fear of the EC directive.

Division Head Heidi Alsing of the Small Farmers' Associations:

"The environmentalists have shouted too loud in this case. Nothing will happen if the directive is adopted. It will be only after years have gone by, when criteria have been established, that it will become evident that any deficiency in comparison with Danish rules has occurred."

Proprietor Steen Rewentlow-Mourier, chairman of the Twelve Man Associations:

"We are interested in maintaining the high standard we have today, and I see no risk that the directive will be

detrimental to the Danish environment. Assuming that the effort to harmonize the rules will not drown under the weight of the bureaucracy, the directive can simplify the costly procedure of approving agents in each individual country and will ensure that the safer agents reach the markets more quickly."

According to the environmental organizations, there are 232 approved spraying agents in Denmark. Within the EC, there are nearly 700 different active substances, of which 40 are common to all EC nations.

Energy Board Reports Decrease in Sulfur, Carbon Dioxide Emissions

91WN0587C Copenhagen BERLINGSKE TIDENDE
in Danish 22 Jun 91 II 2

[Article by Morten Hansted: "Sulfur Pollution Enormously Reduced"]

[Text] Denmark's energy needs are being met with steadily decreasing emissions of sulfur and CO₂. Energy's liability in the balance of payments is also going significantly downward.

The Danish energy sector has in just four years reduced CO₂ pollution by more than 15 percent. At the same time emission of sulfur has fallen by a good 30 percent.

These promising statements were made in the new report from the Energy Board in its latest issue of ENERGY NEWS in which it examines the changes in recent years in energy consumption.

The increased use of electricity from Norwegian hydropower works and Swedish nuclear energy plants is especially beginning to make itself felt, but domestic changeover to natural gas together with increased utilization of district heating is also helping.

The economic side is also looking good. This is due not least to rising oil production which last year provided for 88 percent of the domestic consumption. Denmark's net expenditure for energy import is down under six billion kroner.

Ten years ago import accounted for an amount four times larger in the balance of payments.

It is thought-provoking that the exceptional improvement in the balance of payments in the last 10 years, from a deficit of 13.4 billion kroner in 1980 to the surplus of 10.7 billion kroner brought into the country last year, was due principally to the contribution from the energy sector.

It is helpful also that Danes have now begun to save energy. Whereas it was the pattern in the oil crises of 1973 and 1979 for consumption to take a short dive before rising again in a year or two, once people had accustomed themselves to the new prices, present consumption is now about to level off.

In the last three years, Denmark's energy consumption has remained largely unchanged, according to the Energy Board's calculations.

On the other hand, there are significant shifts among the various energy sources, with oil left holding the bag. The black drops still hold first place as Denmark's most important energy source, but falling oil consumption in recent years, combined with greater burning of natural gas and coal, means that oil in the course of one or two years will presumably lose its leading position.

FINLAND

Nature Conservation League's Energy Program Outlined

91EN0668Z Helsinki HELSINGIN SANOMAT
in Finnish 6 Jun 91 p 9

[Unattributed article: "Nature Conservation League Drafts Energy Program for Finland; Over Half of Energy Needs Could Be Met With Biomass"]

[Text] An interim report on the Finnish Nature Conservation League energy program states that Finland's energy consumption could be reduced by a fifth of its present level by the year 2010. According to the report, this objective would be achieved by economizing and by using new technology.

The league believes that achievement of the objective would not paralyze our society.

Chief inspector Annukka Lehtonen of the Trade and Industry Ministry (KTM) said that the objectives of the league's energy program correspond very closely with the ministry's extreme development alternative. A number of alternative development estimates have been drafted at the KTM. According to the so-called basic model, nearly twice as much energy as proposed in the nature conservationists' program would be consumed in Finland by 2010.

The Nature Conservation League recommends that we switch to the use of renewable sources of energy. They would completely replace peat and coal as well as nuclear power. Over half of Finland's energy would be produced from biomass by 2010.

Presenting the program in the auditorium of Parliament, Assistant Prof. Satu Huttunen said that biomass produced by the fields and forests offers the most renewable energy.

As early as 1989, about 15 percent of Finland's energy needs were produced with wood biomass—that is, nearly as much as with nuclear power and more than with coal. According to the energy program, it would pay to increase the use of biomass so that, for example, industry could be advised to switch from the production of rubbed paper, which consumes electricity, to cellulose paper, which also generates abundant energy during production.

The small power plant to begin production at Kuhmo next year is cited as a good example in the program.

The plant will cost 70 million markkas and will get its fuel from a nearby sawmill and forest thinning scraps. The plant will produce electricity and district heating—its purpose is to protect the energy supply of the population center of Kuhmo.

Once the small plant at Kuhmo is completed, it will provide employment for five new persons in addition to the district heating plant personnel.

According to the report, wind conditions in Finland are among the best in Europe. Wind Power Association chairman and university lecturer Gustav Tallqvist assured us that it is technically and economically feasible to increase our use of electricity derived from wind power—a lack of political determination is the only obstacle.

MP Prof. Martti Tiuri (Conservative), however, pointed out that wind power plants are "ugly looking."

According to the report, the cost of electric power produced by wind is already competitive in, for example, Denmark, and they intend to generate most of their electricity there with wind by as early as 2020.

In California they report that electricity produced by wind and sun is now cheaper than nuclear electricity. In Finland, solar power is still expensive.

FRANCE

Renault, Peugeot Setting Up Systems for Recycling of Automobile Parts

91WN0556A Paris LIBERATION in French
22-23 Jun 91 p 7

[Article by Vittorio de Fillipis: "Renault and Peugeot in the Preserve of Scrap Metal Merchants"]

[Text] Plastic, catalytic converters, and of course, scrap metal—everything is recyclable. The two French automobile manufacturers are following the example of their German competitors and setting up systems for reprocessing automobile wrecks. In order to sell, the car of the future will have to be 100-percent recyclable.

Every year in France, 2 million carcasses are added to the auto cemeteries. That adds up to 1.5 million metric tons. A modest figure compared to the 18 million metric tons of household refuse or the 28 million metric tons of industrial waste which, for their part, are destroyed or recycled. But the stakes are considerable nonetheless. The automobile manufacturers therefore had an obligation to assume their responsibilities.

Following their German counterparts, Renault and Peugeot are now accepting the ecological challenge of a completely recyclable car. The fact is that ecology sells. BMW, which announces in its advertising that its new Series 3 is 80-percent recyclable, has realized that.

In Germany, BMW, Volkswagen, Mercedes, General Motors, and Ford have combined their efforts to deal with questions relative to the destruction of wrecks. In

France, on the other hand, tradition being what it is, Renault and Peugeot are ignoring each other.

Last week Raymond Levy, president of Renault, revealed the main outlines of a plan for salvaging batteries, solvents, plastic bumper shields, and catalytic converters. The French manufacturer wants to set up the first scrap salvage and collection system in its sales network. To begin with, the system will operate in Germany and in France (at sales headquarters in Tours). But Renault officials expect to extend the system to all European countries beginning in 1992.

For that manufacturer alone, 8,000 metric tons of plastic (damaged bumper shields), 700,000 used batteries, 50,000 catalytic converters (for the precious metals they contain), and some 3 million liters of solvents will be collected all over Europe by Renault's 15,000 dealers and agents. Until now, that scrap material has been only partially recycled or simply left in public dumps.

Various companies will cooperate with Renault in recycling the used parts: Metal-Europe in the case of batteries and one of its subsidiaries in the case of plastic shields, Engelhard in the case of catalytic converters, and so on.

Renault also announced upcoming cooperation with the French Scrap Metal Company (CFF), with which the Peugeot Corporation [PSA] has already formed a partnership for recycling automobile carcasses.

And Peugeot is not inactive. On 18 June, Jacques Calvet, the president of PSA, led Minister of Environment Brice Lalonde on a tour of a reprocessing plant for auto wrecks in Saint-Pierre-de-Chandieu near Lyons. In a joint venture with the French Scrap Metal Company and cement maker Vicat, the automobile manufacturer is establishing a pilot site whose long-term objective will be to achieve "zero waste" by completely recycling wrecks.

The CFF is already there and has achieved a recycling rate of 75 percent thanks to the crusher-shredder process, which, however, processes only metal parts. Installation of the Valerco process will make it possible to improve that rate by recycling the crushing residue, which represents 25 percent of the weight of a carcass on average. Ferrous metals will be reintegrated into the steelmaking process, while glass residue will be sent back to the melting furnaces. Mechanical parts will be reworked, and the crushing residue (plastic, glass, nonferrous metals, dirt, and rubber) will be granulated to provide a fuel suitable for industries such as cement manufacturing.

The experiment will be limited to 7,000 automobiles over a two-year period, but as a result, the PSA hopes to find an economic equilibrium for the recycling process.

ELF-Aquitaine Oil Company Investing in Production of Unleaded Gasoline
91WN0601C Paris *L'USINE NOUVELLE* in French
4 Jul 91 p 43

[Article by Pierre Laperrousaz: "ELF Invests Massively in Green Gas"]

[Text] ELF-Aquitaine is investing massively in order to meet the demand for super unleaded gasoline. At Lavera, the oil company is to build an alkylation unit and, at Donges, a continuously regenerating cracking unit, the first of its type in France. The total investment of 1.7 billion francs will enable ELF-Aquitaine to produce over a million tons of high-octane fuel, essential to the manufacture of unleaded gasoline. The latter already makes up 30 percent of the firm's super unleaded fuel and this figure is expected to reach 60 percent by 1995, hitting 100 percent by the end of the decade.

ELF-Aquitaine has not yet chosen the technology it will use for its cracking unit. Two processes are in contention: the one used by the American UOP, already in operation at Koch in Corpus Christi, Texas, and which is in the startup phase at Fina in Anvers; and that of the French Petroleum Institute (IFP), used at a refinery in Ssangyong, Korea, and at Diamond Shamrock in Texas. Cracking is used on naphta, a light oil, and consists of catalytic treatment at high temperatures under pressure. It yields a "reformate" made up of aromatic hydrocarbons, along with hydrogen and light products (butane, propane, and so on). Oil companies are constantly striving to improve the reformate yield of the process and its "severity," meaning its ability to yield a product with a higher octane rating, as well as its yield of hydrogen, a gas they need to desulfurize certain oil products.

To achieve this, they must reduce the pressure in the cracking unit without harming the kinetics of the reaction, which means having more effective catalysts. This is the very principle of continuously regenerating cracking, so named because the catalyst (platinum on an aluminum base) is constantly renewed. The latter is continuously extracted from the reactor, sent to a regenerating section, and recycled into the process. It is estimated that one grain of catalyst goes through a regenerating cycle at least once a week, enabling it to retain maximum efficiency. The result: The yield of reformate is increased by 10 points compared with the conventional procedure, and the octane rating rises to 100-104, compared with 98-100. Another advantage of the continuous regenerating process: The facility no longer has to be shut down several times a year to regenerate the catalyst, an operation that halts operations for at least a week.

CFC Replacement Proving Difficult for Refrigeration Industries

91WN0601A Paris *LE NOUVEL ECONOMISTE*
in French 5 Jul 91 p 30

[Article by A.J.: "Refrigeration Industry Alarmed"]

[Text] Replacing CFC's, the chlorofluorocarbons blamed for making the hole in the ozone layer, is turning out to be more difficult than anticipated. The Madrid protocol completed by the London agreement bans the use of such gases after 1 July 1997, gases more commonly known by their brand names of Forane, made by Atochem, and

Freon, by DuPont de Nemours, the two biggest producers in the world. However, replacing them may be extremely expensive. Speaking for the French Refrigeration Association, Claude Brian estimates the cost to refrigeration industries (which use some 7,000 tons of the substances a year) at between 45 and 75 billion francs [Fr].

Pressure From Ecologists

It will all depend on Germany, deemed by some to be too complacent toward its ecologists. At the heart of the debate: the use of HCFC22, more commonly known as R22, which Bonn plans to ban by the year 2000, replacing it with 134A. However, R22, manufactured by Atochem, DuPont de Nemours, ICI, and Hoechst (at a cost of about Fr45 a kilo), is the only one of the three gases used so far by the refrigeration industry that has been approved by the new international regulation, while R12 (Fr10 to Fr30) and R502 (Fr35 to Fr60), two CRC's, are doomed to disappear.

The price of 134A, a product containing no chlorine but which is flammable and therefore dangerous, is between Fr100 and Fr150 a kilo, triple the price of R22. It will not be on the market in large quantities until facilities now being built go into service around 1995: 9,000 tons from Atochem at Pierre-Benite near Lyon, 3,000 tons from Great Britain's ICI, and 3,000 tons from DuPont de Nemours. Furthermore, this 134A, which requires major conversions of existing facilities, cannot be substituted for R22 in all of its current applications.

Plans for Achères Water Treatment Facility Cancelled

91WN0601B Paris *LE MONDE* in French 14-15 Jul 91
pp 11-12

[Article by Jacqueline Meillon: "Achères Purification Station Will Not Be Expanded"]

[Text] Jacques Chirac promised to take a dip there in 1994, but he will have to wait patiently for a few more years if he wants to plunge into the clean water of the Seine. Not until about the year 2000 is the Parisian river scheduled to be restored to "zero pollution." The "Clean Seine" oversight committee, headed this year by Didier Julia, RPR [Rally for the Republic] deputy from Seine-et-Marne and vice president of the Ile-de-France Regional Council in charge of environmental problems, has laid down the guidelines. It is quite simply a matter of canceling the fifth phase of the Achères purification station in Yvelines in order not to run the risk of too much pollution and also, incidentally, a financial black hole.

Achères will therefore retain its current capacity of 2.1 million cubic meters of treated water a day during the dry season, going as high as 2.5 million cubic meters during storms. Achères V, planned for the early 1990's, was originally to increase total capacity to 2.7 million cubic meters. The Yvelines facility would have become

the largest purification station in the world. It is currently in second place behind Chicago. Moreover, it can only retain that place if it undergoes a face lift to neutralize the olfactory and noise pollution resulting from its activities. Such an operation would reduce such nuisances by 90 percent.

For Julia, there can be no question of going back on the decision to abandon Achères V. "If we built Achères V," he explains, "we would be making the same mistake and creating the same scandal that we did at La Villette. Furthermore, if it fails, I, as the elected official, will be alone in shouldering the blame." Moreover, he says, the Regional Council and the Seine-Normandy Water Agency, called upon to cofinance the Achères extension, quite simply canceled the credits. As for the government, it had already come out against Achères V through the then Prime Minister Michel Rocard and Minister of Environment Brice Lalonde. The new prime minister, Edith Cresson, can scarcely challenge this position taken on the side of protecting the environment.

As a tradeoff, the Regional Council has proposed setting up a new station at Colombes, which would take in nearly 400,000 cubic meters of water a day. Indeed, the Achères purification station, built based on 1934 techniques, will no longer meet the demands of the year 2000, which is precisely what residents of La Frette-sur-Seine or Herbey, located on the opposite side of the Seine on the right bank facing the station, have been saying for years. Many came to live on the river's shores thinking they had found a paradise. The village of La Frette (3,800 inhabitants), some 15 km from Paris, slopes gently toward the river. Its homes and gardens—no apartment buildings—and lilac bushes that perfume the air with the first breath of spring inspired the writer Chardonne, who went there to live, and Roger Ikor, who used it as the setting for his novel *Les Eaux melees* [Mingled Waters]. Unfortunately, this was before the Achères purification station came along with its nauseating odors and constant noise, particularly since, as decades passed, it grew, expanding its capacity to treat waste water from the Parisian region (Paris and the three departments in the little ring, some 8 million people), but at the price of a frightful disaster! Since the treatment process is not 100-percent effective, some 20 percent of all the water sent through the station every day reaches the Seine untreated.

At the present time, some 300,000 cubic meters are dumped into the river untreated and the figure goes even higher during storms. Residents still recall the June 1990 catastrophe, when some 5 to 8 million cubic meters of rain water poured into the Seine in a matter of hours, killing 80 tons of fish. With Achères V, grey water the equivalent to the amount of a city the size of Marseille (540,000 cubic meters) would be dumped into the river, not to mention the smell and noise.

Maurice Chevigny is president of the La Frette Village Association, which has been trying to make its voice heard since 1989: "The smell is especially bad at night. The peak hours are at about 2200, and when it is windy,

the smell goes as far as Montigny, Argenteuil, and Sartrouville." For Paul Guyomard, another Association member, "It sounds as if there were a barge with an old engine constantly running in front of the house."

An initial order issued by the prefect of Yvelines on 26 December 1989 asked the operating agency, the Interdepartmental Union for Purification of the Paris Metropolitan Region (SIAAP), to submit possible ways of attenuating the problems. SIAAP complied by presenting a schedule to which it has so far adhered. Among the projects: covering decanters and storage vats of baked sludge, confinement of safety valves and spillways located in the commune of La Frette with deodorization of sewer water discharged, reduction in the sludge drying beds that produce the bad odors and the installation of filter presses, and covering waste water receiving basins. Grease obtained from the pretreatment of sludge will be destroyed by incineration at a temperature of 850 degrees.

Environmental University

This entire program must be completed by the end of 1992 at a cost of nearly 300 million francs [Fr]. However, a new prefectoral order is to be signed in September to add an additional program costing another Fr440 million covering the period until 1994. A third, running until the year 2000, is not to be ruled out. The total is nearly Fr1 billion and includes modernization of the first three phases of the station in order to adapt them to the current limitations of rain water processing by skimming and storage, the treatment of nitrates and carburetted waste, the treatment of odors by recovery from the station, and an air depressurization system.

The fifth Sevres-Acheres grey water collector, designed as part of station expansion plans, is under construction on a 17-km plot stretching from Saint-Cloud to La Frette and running through Rueil, Nanterre, and Sartrouville. It will collect rain water and some 150,000 cubic meters of grey water now currently dumped into the Seine downstream from Paris.

The regional water plan provides for the decentralization of purification stations, which would be brought closer to sources of pollution. However, for the vice president of the Regional Council, the stakes are no longer solely limited to Ile-de-France. It is now a national issue: "If we in France are not capable of building, as they have done in Monaco, a purification station that does not pollute," Julia says, "then by 1993, the calls for bids will be international. Germany and Sweden are already on the lists." And yet, France does have the know-how. The team now in charge of the Marne-Zero Pollution operation, the Central Office for Overseas Studies (BCEOM), is also working on the Vistula and the Oder. If one can at least go by the results of the Ciudagua seminar recently held in San Jose, Costa Rica, the operation on the Marne was chosen by the European Community as the standard for all cleanup projects on European waterways. Which is probably why Julia hopes to start an environmental university right next to the future Colombes station, a

university to be financed by the Lyon Water Company, General Water Company, and Ile-de-France Regional Council.

As for the SIAAP, even if its experts were not happy to abandon Acheres V, it was decided to set up an odor-monitoring station. Residents will be asked to give their impression by phoning a green number. A salute to all good noses!

GERMANY

Government Interim Report on Radioactive Waste Disposal Research

91MI0267A Bonn TECHNOLOGIE NACHRICHTEN-PROGRAMM INFORMATIONEN in German
18 Mar 91 pp 1-16

[German government report: "Direct Permanent Storage: Research Status and Prospects"]

[Excerpts]

Table of Contents

1. The German Disposal Concept
2. Legal and Political Framework for Direct Permanent Storage Development
3. The Direct Permanent Storage Method
 - 3.1 Disposal with reprocessing and direct permanent storage
 - 3.2 Technical concepts of direct permanent storage
 - 3.3 Direct permanent storage as a research and development task
 - 3.4 Outline direct permanent storage R&D program
4. Status of Development Work on Direct Permanent Storage
 - 4.1 Conditioning of burnt-out fuel elements
 - 4.2 Containers for direct permanent storage
 - 4.3 Development and testing of permanent storage technology
 - 4.4 Systems analysis and planning work for a permanent storage mine
 - 4.5 Individual experimental studies
5. Future Work Under the Direct Permanent Storage R&D Program
6. Cost Framework
7. Assessment of Direct Permanent Storage

Figures

1. The German Disposal Concept

The safe disposal of nuclear power station waste, especially the regulated removal of radioactive waste, is of outstanding importance for the peaceful use of nuclear energy. For the German government, the safe disposal of nuclear power station waste remains an absolute prerequisite for their construction and operation.

Disposal is based on the Atomic Law, the federal government's disposal concept, which embodies the legal

provisions, and the basic principles for disposing of nuclear power station waste.

The legal foundation for disposal is Art. 9 of the Atomic Law (AtG), which provides that those who accumulate radioactive residue must ensure that it is:

- safely reprocessed or, where this is not possible with the current state of science and technology, is not economically viable, or is not compatible with the protective aim of the Atomic Law;
- properly disposed of as a radioactive waste.

Integrated Disposal Concept With Development of Direct Permanent Storage

Since the federal government duly concluded its safety evaluation of other disposal techniques as requested by the heads of government in their decision of 28 September 1979, the disposal concept consists of four main steps:

1. Interim storage of spent (burnt-out) fuel elements in the nuclear power stations and in off-site interim stores;
2. Reprocessing the spent fuel elements and feeding the nuclear fuel thus recovered back into the nuclear power stations (recycling);
3. Developing direct permanent storage for spent fuel elements for which reprocessing is not technically feasible under Art.9 of the AtG; Further developing direct permanent storage methods for spent fuel elements from light-water reactors;
4. Removing radioactive waste via intermediate steps:

- conditioning;
- interim storage in nuclear engineering facilities, in off-site stores, or at land-level collection points;
- interim storage of high-level, heat-developing waste (glass blocks) in interim stores;
- permanent storage. [passage omitted]

2. Legal and Political Framework for Direct Permanent Storage Development

Comparative Safety Research: Reprocessing/Direct Permanent Storage.

In accordance with the decision of the heads of the federal and land governments on the disposal of nuclear power station waste, passed on 28 September 1979, the technical feasibility of direct permanent storage was tested and the system and comparative studies on reprocessing/direct permanent storage were carried out under a research and development program ("Other Disposal Methods" study) headed by the Federal Minister of Research and Technology. The safety evaluation was undertaken by the Federal Ministry of the Interior, advised by the Reactor Safety Committee (RSK) and the Radiation Protection Committee (SSK), and with land Atomic Law Authority participation. On 23 January 1985, the federal government assessed the results of the study and summarized the conclusions to be drawn from them in a statement.

The results of the study and the documents setting out the federal government's evaluation were forwarded to the German Bundestag's Internal Affairs Committee and Committee on Research and Technology. At the public hearing of the Bundestag Committee on Research and Technology held on 27 March 1985, a majority of experts supported the assessment presented by the federal government.

Research and Development Program

The aim of the research and development work being carried out pursuant to the federal government's decision of 23 January 1985 is to develop the technology of direct permanent storage quickly—especially for those fuel elements that cannot be reprocessed economically—to the point at which it is ready for application. The development of conditioning methods for spent fuel elements, including the permanent storage containers, is the responsibility of industry, while the Federal Ministry of Research and Technology is carrying out the research work pertaining to permanent storage sites. All sub-projects, including those on the permanent storage of spent fuel elements from high-temperature reactors, are closely correlated. The safety evaluation aspect of the research and development work is the responsibility of the Federal Ministry of the Environment, Nature Conservation, and Reactor Safety, advised by the RSK and the SSK and with the participation of the Atomic Law authorities of the laender. [passage omitted]

Pilot Conditioning Plant in Gorleben

On 6 May 1986, the German Nuclear Fuel Reprocessing Company (DWK) applied to the Lower Saxony Ministry of Federal Affairs for a permit under Art. 7 of the AtG to build and run a pilot conditioning plant in Gorleben. This project is intended to examine whether the conditioning of, in particular, spent fuel elements such as those from high-temperature and light-water reactors is technically feasible and compatible with the Atomic Law. The plant is designed to deal with 35 tonnes of heavy metal a year.

The intention is to condition the fuel elements so that they can be delivered to an interim or permanent storage site in suitable containers. Details of the container and storage safety requirements are currently under study; no applications have yet been made for stock-piling in an off-site interim store.

The first partial permit (site, design, and construction work) was granted on 30 January 1990. The pilot conditioning plant is scheduled to begin operations in 1994. [passage omitted]

3. The Direct Permanent Storage Method

3.1 Disposal by Reprocessing and Direct Permanent Storage

Pursuant to the residue recycling requirement laid down in the Atomic Law, disposal by reprocessing the spent elements is the concept primarily followed in Germany.

This involves recovering the unspent nuclear fuel contained in the fuel elements by a chemical process and preparing the remaining waste material—separated into heat-developing and non-heat-developing wastes—for permanent storage. This system of disposal may generally be applied to all fuel elements from light-water reactors.

The direct permanent storage process, which is the only method envisaged for high-temperature reactor (HTR) fuel elements and is to be developed in parallel for light-water reactor (LWR) fuel elements, will not comprise the recovery of recyclable nuclear fuel, and the spent elements will be placed in direct permanent storage without reprocessing. Waste form different levels of activity (high-level/intermediate-level) can only be separated mechanically (e.g., by dismantling the fuel element and separating the fuel rods and structural parts).

A mixed form of storage is being set up in the planned permanent storage site in Gorleben, as both waste from reprocessing and spent fuel elements are to be placed in permanent storage there, side by side.

3.2 Technical Concepts of Direct Permanent Storage

In view of the current stage reached in R&D, two alternative methods are being considered for storing radioactive waste in permanent stores in deep geological formations:

- storage in horizontal tunnels, and
- storage in vertical shafts

Tunnel storage (Fig. 1)

In tunnel storage, undismantled spent LWR fuel elements or several HTR fuel-element containers are packed into large containers and stored in the underground tunnels of the permanent storage mine. The tunnel section is then filled up (caulked) with salt. The containers must both encase the radioactive materials and act as a radiation screen during handling. They remain intact in the permanent store.

For reasons of economy, particularly large containers are used for this storage method. For example, a typical container ("Pollux") holds eight spent pressurized water reactor fuel elements and weighs about 65 tonnes when full.

The technical equipment necessary for handling such containers in a mine, and especially during shaft transport, is not yet commercially available.

Shaft Storage (Fig. 2)

In shaft storage, the high-level material is packed in drums or drum-like containers and sunk in a sealable, 300-meter deep shaft. Whereas the relatively small, spherical HTR nuclear elements are packed directly into the barrels, the nearly four-meter long LWR elements are first dismantled and the individual rods cut into pieces about one meter long before they are packed into what are known as shells.

A screening container is used as protection against radiation during transport to the shaft; the drum or shell is then removed from it and sunk into the shaft. The screening container can be used again for another storage run.

Once inside the shaft, the radiation from the waste is screened by the surrounding salt and by a shaft-sealing mechanism.

The technical equipment necessary for these handling operations (shaft transport, surface transport, winding machinery) is already available for glass shells with reprocessed waste or is being developed during the R&D on permanent storage.

3.3 Direct Permanent Storage as an R&D Project

As compared with reprocessed waste, the activities, thermal outputs, weights, and dimensions of the drums for placement in permanent storage vary, so the technology, and also the interaction of the drums with the permanent storage medium, salt, vary too. They must be developed and studied separately for direct permanent storage. Nuclear approval procedures require, moreover, that the processes and equipment necessary for permanent storage reflect the latest advances in science and technology. They must therefore be developed in sufficient detail (e.g., the pilot conditioning plant) and tests must show that the packing drums are reliable enough for safe handling.

Before the direct permanent storage method can be considered ready for application, the following important questions must be answered:

- What is the best way to condition the fuel elements safely (e.g., packed or cut into pieces)? How must the direct permanent storage containers be designed to screen radiation safely and encase the fuel elements for as long as possible?
- Can 85-tonne loads (containers and flat-bed trucks) be taken safely into a mine and can the containers be handled safely underground?
- How do the technical storage concepts (shaft storage and tunnel storage) and the various kinds of waste interrelate with one another? Which storage concept provides the best solution in terms of operation and long-term safety? How can international monitoring of nuclear material be ensured?

In order to answer these questions, possible storage concepts must be studied and the effects of suitable alternatives assessed. Furthermore, the processes required to condition LWR fuel elements must be developed and field-tested (pilot conditioning plant).

It must be demonstrated that the heavy drums used in tunnel storage can be safely handled in the entire permanent storage area.

3.4 Outline Direct Permanent Storage R&D Program

An outline R&D program was set up in 1986, after the cabinet decision to proceed with direct permanent

storage development, to carry out the requisite development work. It includes the following headings:

- Conditioning plant and containers;
- Field trials;
- Systems analysis and permanent storage planning;
- Individual experimental studies on the behavior of nuclear fuel material and drums in permanent storage conditions

The program is being carried out under the Disposal Project management team at the Karlsruhe Nuclear Research Center, on behalf of the BMFT [Federal Ministry of Research and Technology]. This team is backing up the work on conditioning and container development financed and carried out by industry (Nuclear Safety Company—GNS) and coordinating the research and development work on actual permanent storage carried out by the BMFT through major research institutes and as special projects.

The program is scheduled to run until 1995. The current stage reached in development, at a little over half-term, is presented in the following section.

4. Status of Development Work on Direct Permanent Storage

As it is planned to incorporate direct permanent storage technology into the planning process for the permanent storage site to be located at Gorleben, the time frame for the R&D work on direct ultimate storage depends on when this process will begin. At the earliest this will be after completion of underground surveying in the Gorleben salt dome in 1999.

With the work carried out to date, progress in the project is on schedule. The interim results achieved were presented exhaustively in a Karlsruhe Nuclear Research Center status report and discussed by the technical experts in 1990. The results show that the FRG is world leader in this disposal technology.

The context of the status report confirms that a number of questions relevant to direct permanent storage have been answered and that major guidelines have been established for further work. This is true both for the pilot conditioning plant and container development, and for the research and development work that needs to be done on the permanent store.

The advances achieved since the beginning of the program under the individual R&D headings with a view to developing direct permanent storage to the point where it is ready for application are set below.

4.1 Conditioning of Spent Fuel Elements (Fig. 3)

On the basis of the groundwork done in 1980-1984 under the BMFT's funding program on "Other Disposal Methods," the GNS (formerly DWK) [German Nuclear Fuel Reprocessing Corporation] drew up the concept for a pilot conditioning plant. It will develop and field-test

the packaging suitable for storing radioactive residue—both spent fuel elements and radioactive waste—for direct permanent storage.

The plant is designed to field-test the various methods of packaging and, where necessary, cutting up fuel elements, fuel rods, and fuel element components, and packaging glass shells. It can condition a maximum of 35 tonnes of heavy metal fuel elements per year.

Status:

Optimization of pilot conditioning plant's major components based on cold experiments is mostly complete. The first partial permit to build the pilot plant of Gorleben was granted at the end of January 1990; building work has started.

4.2 Direct Permanent Storage Containers (Figs. 4 and 5)

Two options are planned for the permanent storage container in shaft storage of HTR fuel elements: a thick-walled, self-supporting cast container or a thin-walled rolling hoop drum, whose backfill of spherical HTR fuel elements stabilizes it against earth mass pressure. The Pollux container, as it is known, is being developed by the GNS for packing spent fuel elements for tunnel storage. These containers are independent ultimate storage drums, which meet the requirements of both transport and interim storage. When full, a container will weigh about 65 tonnes and consist of:

- a welded permanent storage container to ensure gastight encasement of the fuel elements and to resist the mechanical forces exerted by the surrounding rock;
- an outer anti-corrosion protection to resist the corrosion to which it will presumably be exposed, and
- a disposable cast Spaero screen to ensure protection against radiation during transport by the disposal company.

This modular construction makes it possible to adapt the container system flexibly to any additional boundary conditions to which it may be subject.

In addition to the Pollux container, a considerably smaller Pollux shell is also being developed for storing LWR fuel elements in shafts. It can be handled with the technology already developed for the transport and ultimate storage of highly radioactive shells.

The fuel rods must be cut into pieces about 1 meter long in the pilot conditioning plant before they can be loaded in a Pollux shell. The Pollux shell is not in itself a complete permanent storage drum, as it requires an extra casing during transport.

Status:

A series of design calculations and drafts for the Pollux container has been completed and initial prototypes are currently being made. A testing and quality control scheme has been developed to ensure that the containers present the requisite properties, and substantial production components of the Pollux system are being tested.

4.3 Development and Testing of Permanent Storage Technology

Trials are being carried out on the large, heavy Pollux containers so that this storage method can be developed and tested with a view to applying for licensing under the Atomic Law. These trials are designed to demonstrate that:

- payloads of up to 85 tonnes (container and vehicle) can be safely transported in the shaft;
- permanent storage drums of similar weights can be safely handled and deposited underground, and
- current computing procedures are capable of forecasting the thermal and thermo-mechanical behaviour of the surrounding salt rock with certainty.

The components for an 85-tonne conveyor plant that are not yet state-of -the-art will be built and tested as part of the field testing program for the safe shaft transport system for heavy drums. To this end, a test-bed is currently being built in the turbine hall of a former power station to simulate the hoisting cage load and test the safety devices designed to prevent crashes in the shaft.

The technical equipment for handling the drums in tunnel storage must be designed and tested, experimental data as to the reliability of the underground storage system acquired, and failure repair trials carried out. These trials are initially being performed in a hall above ground, although the spatial condition prevailing in an underground storage tunnel have been reproduced as realistically as possible.

The thermal simulation trial takes account of a special feature of tunnel storage in Pollux containers, i.e., the fact that larger cavities must be filled with salt than in shaft storage and that the anticipated thermal and thermomechanical effects on the salt rock will differ from those expected to occur in shaft storage.

Status:

Planning work for the test-bed for simulating shaft transport has been completed. The trials and initial results are scheduled for 1992.

The components to be tested for tunnel storage, i.e., the rail-mounted transport vehicle and the storing device, have already been built or will soon be commissioned. Above-ground testing is scheduled for 1992-93.

The thermal simulation field trial began when the heater was switched on in September 1990. The measurements will cover a period of at least three years and may also be extended for at least two more years. They include temperatures, stresses, deformation, corrosion processes, and the behaviour of the salt rock and packing material.

4.4 Systems Analysis and Planning Work for Permanent Storage Mine

The planning work for a combined permanent storage scheme, whereby spent fuel elements are permanently stored side by side with reprocessing waste, accounts for a conspicuous part of the systems analysis work. This work has involved testing several types of storage (e.g., shaft storage alone, tunnel storage alone, or combined

shaft and tunnel storage) and many quantitative ratios and radioactive decay times so that the most promising alternative would be selected for further detailed planning.

One important boundary condition was an upper limit of 200°C for the maximum permissible salt temperature. The possibility of water-free conditioning for intermediate-level waste was also taken into consideration, since, unlike conventional conditioning with cement, it allows this type of waste to be stored at a higher temperature.

Status:

Two of six individual concepts were selected for further detailed study in the combined concept systems analysis:

- a concept combining shaft storage for spent HTR fuel elements, intermediate-level waste drums, and high-level waste with separate tunnel storage for (undismantled) LWR fuel elements in Pollux drums, and
- a concept of multilevel tunnel storage alone, whereby spent HTR and LWR fuel elements, high-level waste shells, and intermediate-level waste are permanently stored exclusively in Pollux drums in tunnels.

Tunnel storage is thus the reference concept for further R&D on direct permanent storage, although the concept of shaft storage for LWR fuel elements cut into pieces in Pollux shells will still be studied as an alternative until the technical questions regarding the transport of the heavy Pollux drums in the shaft have been answered conclusively.

The work carried out in connection with these analyses also showed that—based on present knowledge—fuel elements need no more permanent storage space than reprocessing waste. Moreover, a considerable system advantage can obviously be achieved for the system if heat-developing intermediate-level waste from reprocessing is conditioned without water. This reduces the quantity of waste, the space necessary in the permanent store, and the exposure of personnel to radiation, and has a positive influence on long-term safety.

4.5 Individual Experimental Studies

These laboratory experiments focus on corrosion in container materials and leaching in spent LWR fuel elements.

Status:

Corrosion tests to date indicate that the effectiveness of the material intended to provide protection against corrosion depends heavily on the process used to produce the protective layer. However, a theoretical study of the service life of the Pollux container has demonstrated that it can act as long-term barrier even without protection against corrosion.

5. Future Work Under the Direct Permanent Storage R&D Program

The planned field trials designed to prove that the containers can be safely handled, transported, and stored can begin in May this year. They will be completed by the end of 1995; the findings regarding the technical safety with which the heavy drums can be transported in shafts, which are of crucial importance for the concept, will be available in 1992.

The contribution made by neutron radiation to the personal dose during drum and shell handling, with particular reference to the influence of backscatter neutron radiation from the salt rock, is also scheduled to be established experimentally by 1993 as a basis for assessing handling issues from a radiological point of view. The experiments and calculations planned for this purpose are also being sponsored as a research project by the Commission of the European Communities.

Future planning work in connection with the permanent storage site will concentrate on the selected reference concepts and increasingly take the form of a working model based on the structural configuration of the Gorleben salt dome. By applying this model, which is based on results available to date from ground-level surveying and general geological experience, more realistic boundary conditions are incorporated into the planning, replacing the assumptions. Furthermore, in basic studies nonspecific to any particular site:

- The bearing that high burn-up uranium fuel elements and reprocessed uranium and mixed oxide fuel elements have on the permanent storage space required and on the radiological parameters is being investigated;
- In-depth thermomechanical analyses of multilevel tunnel storage and the maximum temperature of the immediately surrounding salt (200°C) are being carried out, and
- The planning principles are being adapted to the new disposal situation (smaller quantities of spent fuel elements, reprocessing abroad, etc.).

Further detailed studies of radiological safety in the permanent store will also be carried out, primarily with regard to the formation and release of hydrogen in the permanent store, and the long-term corrosion and leaching experiments will be continued.

With regard to the issue of international nuclear material monitoring, a safeguard concept is being drawn up and will be developed at the international level to the point where it is ready for application. To this end, concepts and procedures must be developed for monitoring the mine workings (design verification) and for checking the identity and soundness of drums and transport containers, and potential anomalous events must be analyzed.

However, the solution to safeguarding issues will not be sought only at the national level. If these matters are to be settled with a view to establishing safe, operationally practical principles, a concerted approach is necessary among all the countries (e.g., the United States and Sweden) that want to adopt direct permanent storage as their disposal method. The BMFT will make every effort to ensure that the alternatives selected for reasons of technical safety and currently under development are adhered to in this international debate.

6. Cost Framework

In accordance with the federal government's responsibility for creating permanent storage sites, as established in the Atomic Law and with the regulations that make the energy industry responsible for providing advance capacity, the BMFT's financial commitment in this program is limited to R&D work on permanent storage that is neither site- nor plant-specific. This work currently absorbs funds totaling about 165 million German marks [DM] (as opposed to the DM150 million originally budgeted) for the entire general program, which has been running since 1986.

Expenditure to date totals about DM80 million. About half this amount came out of the basic financing of the Juelich and Karlsruhe research centers and the balance from BMFT project financing. In the work still outstanding, which has a budget of about DM85 million, the share from project funding will rise to about DM50 million.

The [cost of] work on conditioning and developing containers is being borne by the energy industry; it includes the construction of the pilot conditioning plant in Gorleben and will cost about DM500 million overall.

7. Assessment of Direct Permanent Storage

Provisions for disposal are based on the integrated disposal concept. Pursuant to the obligation to recycle residue, as laid down in the Atomic Law, priority is being given to proving reprocessability and to achieving developments in permanent storage. However, in order to open up the whole potential for nuclear power station waste disposal, the federal government wrote the development of direct permanent storage into the integrated disposal concept at an early stage.

The stage currently reached in the R&D work does not provide a full basis for a conclusive technical assessment of direct permanent storage, nor of the extent to which its application is necessary and desirable. This applies both to the requisite adjustment to the change in quantities of high burn-up elements and fuel elements with reprocessed uranium and mixed oxide systems, and, to an even greater extent, to the development of a nuclear material monitoring concept. These safeguard issues can only be addressed intensively in the current advanced stage of the project, now that the many potential alternative permanent storage concepts have been narrowed down to two selected reference concepts.

As well as technical aspects, the political and legal assessment of direct permanent storage must also take account of energy and waste disposal policy aspects that naturally go beyond the terms of reference of the research work presented here. They include, for example, the question of economic viability within the meaning of Art. 9 of the AtG mentioned above.

The economic considerations incorporated into the systems analysis of the combined concept so as to present a choice of systems within the combined concept itself confirmed, although only tentatively, the earlier premise that direct permanent storage is a cheaper method of dealing with spent fuel elements than reprocessing. However, at the current status of the project, in view of the limited scope of the study, these consider-

ations cannot be regarded as a quantitative basis for assessing whether it is possible to deviate from the obligation to process residue within the meaning of the AtG and, if so, for which fuel elements.

A comprehensive assessment of direct permanent storage will be made as the Atomic Law and the waste

disposal concept evolve, and will subsequently be embodied in the planning process. Progress according to the direct permanent storage development schedule within the integrated disposal concept will be a prerequisite in this connection, if direct permanent storage is to have a place in the disposal system.

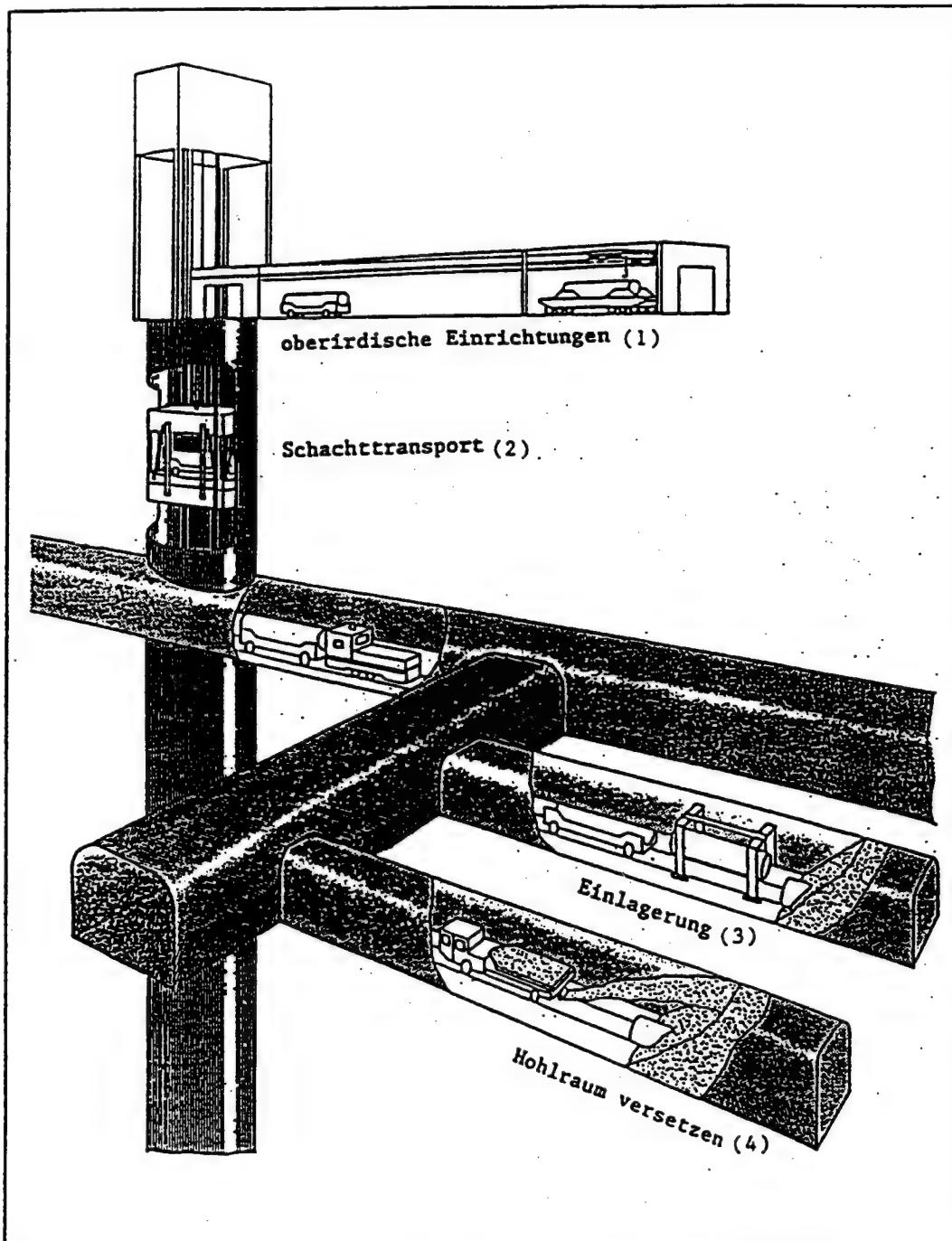


Fig 1: Tunnel storage of fuel elements intended for direct permanent storage (Source: DBE [German Permanent Store Construction and Operation Company])

Key: 1. ground level installations—2. shaft transport—3. placement in storage—4. caulking vacant space

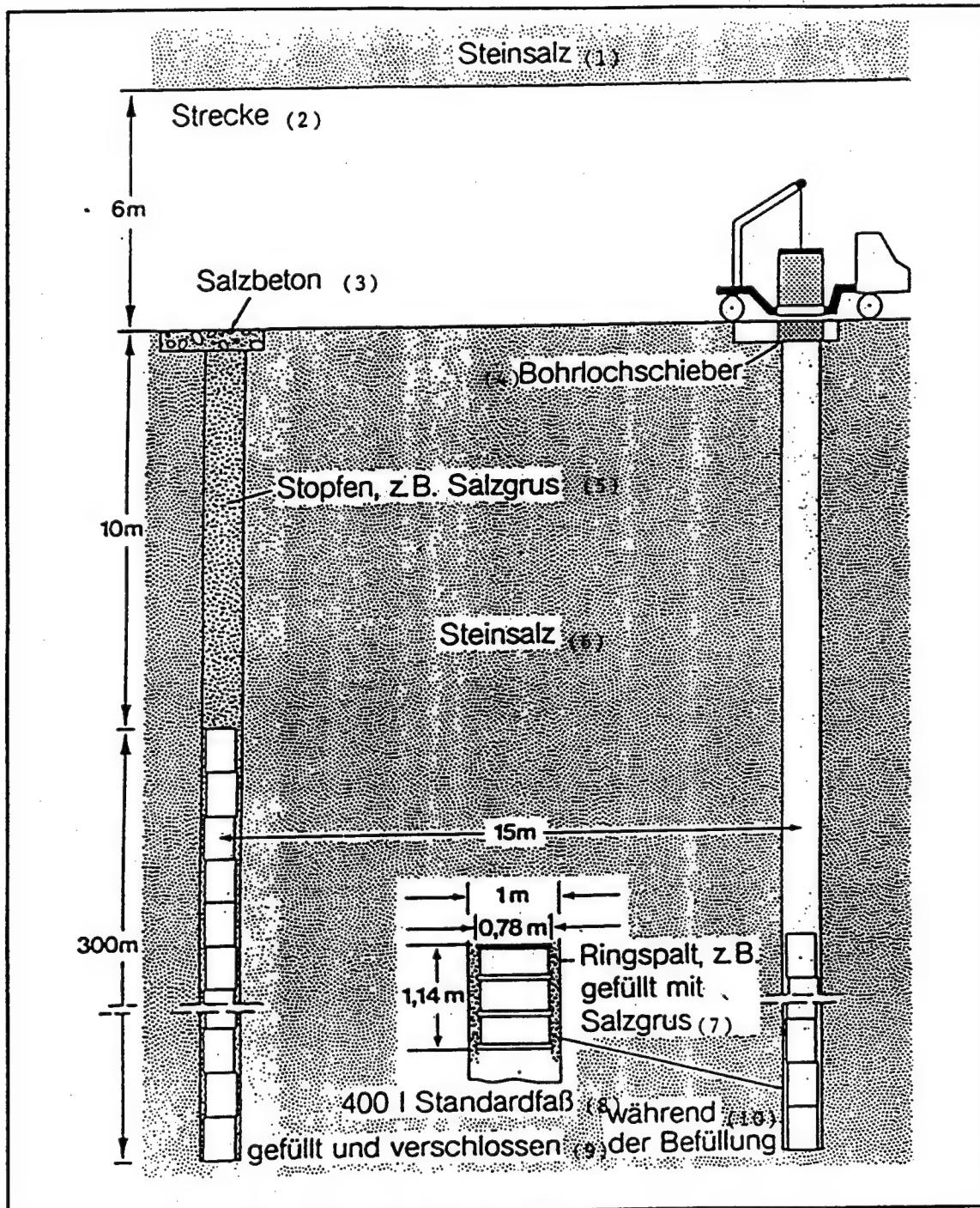


Fig 2: Shaft storage of fuel elements intended for direct permanent storage (Source: KFA [Nuclear Research Center Juelich])

Key: 1. rock salt—2. tunnel—3. salt concrete—4. blow-out preventer—5. caulking e.g., salt slack—6. rock salt—7. clearance filled, e.g., with salt slack—8. 400-liter standard drum—9. filled and sealed—10. during filling

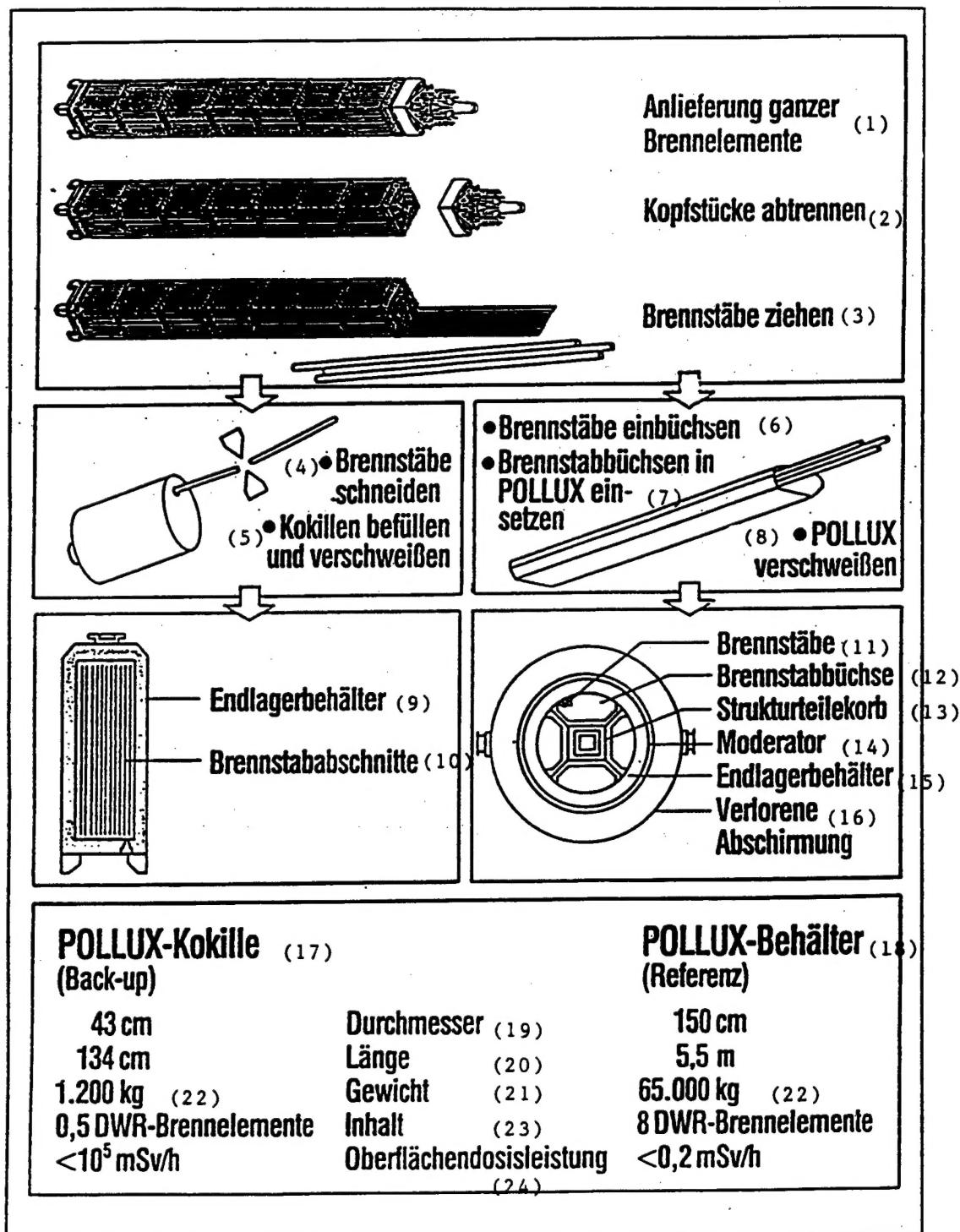


Fig 3: Conditioning alternatives for LWR fuel elements (Source: KfK [Karlsruhe Nuclear Research Center])

Key: 1. delivery of complete fuel elements—2. upper end caps removed—3. fuel rods extracted—4. fuel rods cut—5. shells filled and welded—6. fuel rods boxed—7. fuel element boxes inserted into Pollux—8. Pollux welded—9. permanent storage container—10. fuel rod sections—11. fuel rods—12. fuel rod box—13. structural section cage—14. moderator—15. permanent storage container—16. disposable screen—17. Pollux shell (back-up)—18. Pollux container—19. diameter—20. length—21. weight—22. pressurized water reactor fuel elements—23. content—24. surface dose rate

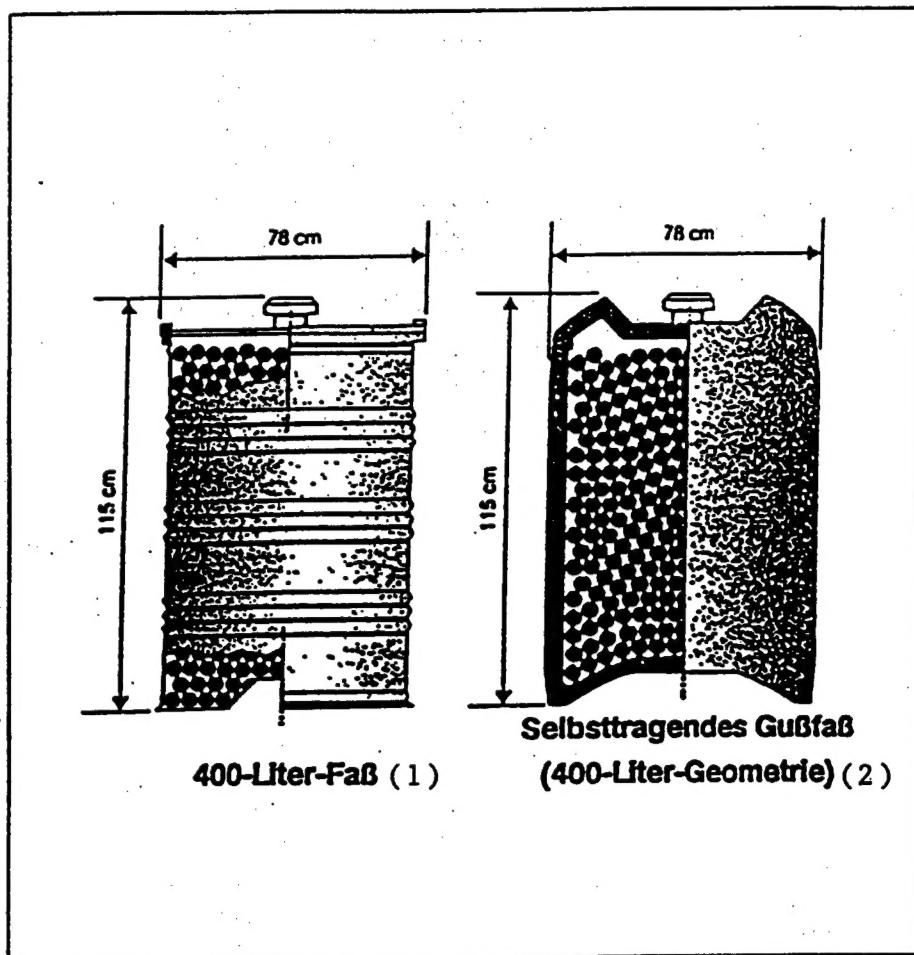


Fig 4: Direct permanent storage container for HTR fuel elements (Source: KfK) 1. 400-liter drum 2. self-supporting cast drum (400-liter geometry)

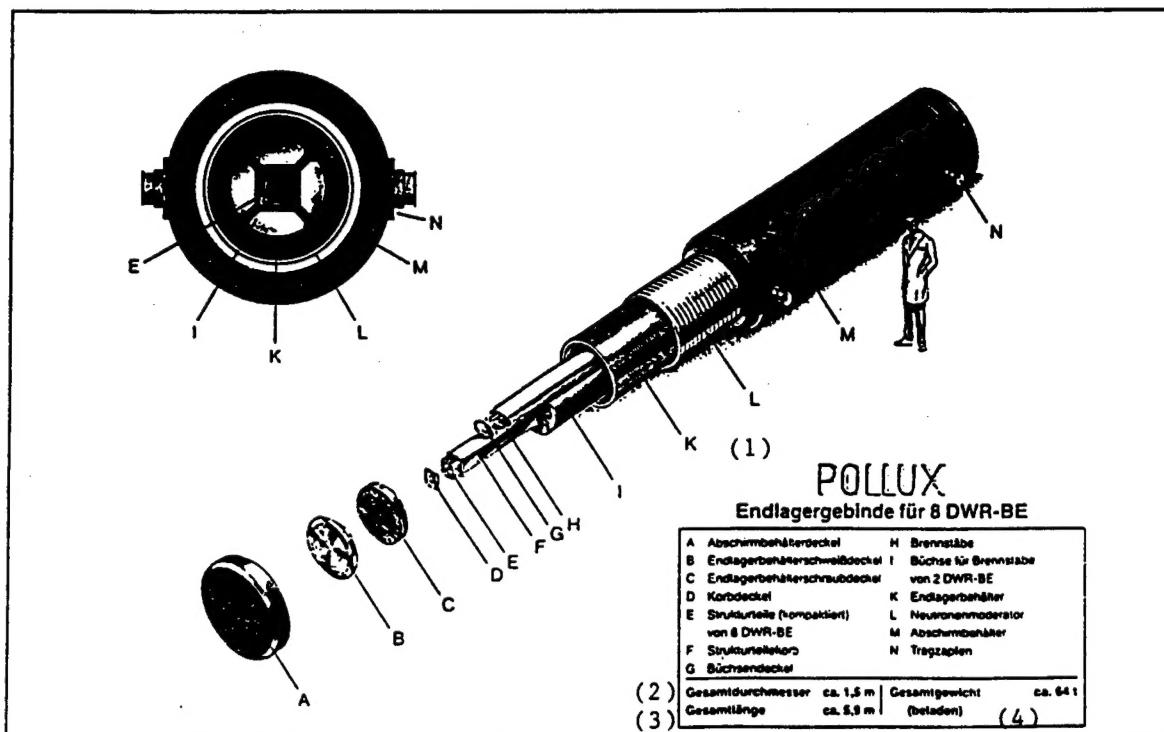


Fig 5: Pollux container for tunnel storage of LWR fuel elements (Source: DWK)

Key: 1. Pollux permanent storage drum for eight pressurized water reactor fuel elements A. screen container lid B. permanent storage container weld lid C. permanent storage container screw-on lid D. cage lid E. structural sections (compacted) of eight pressurized water reactor fuel elements F. structural section cage G. box lid H. fuel rods I. box for fuel rods from two pressurized water reactor fuel elements K. permanent storage container L. neutron moderator M. screen container N. lifting lug—2. Total diameter approx. 1.5 m—3. Total length approx. 5.9 m 4. Total weight (when loaded) approx. 64 tonnes.

NTIS
ATTN: PROCESS 103
5285 PORT ROYAL RD
SPRINGFIELD, VA

2

22161

This is a U.S. Government publication. Its contents in no way represent the policies, views, or attitudes of the U.S. Government. Users of this publication may cite FBIS or JPRS provided they do so in a manner clearly identifying them as the secondary source.

Foreign Broadcast Information Service (FBIS) and Joint Publications Research Service (JPRS) publications contain political, military, economic, environmental, and sociological news, commentary, and other information, as well as scientific and technical data and reports. All information has been obtained from foreign radio and television broadcasts, news agency transmissions, newspapers, books, and periodicals. Items generally are processed from the first or best available sources. It should not be inferred that they have been disseminated only in the medium, in the language, or to the area indicated. Items from foreign language sources are translated; those from English-language sources are transcribed. Except for excluding certain diacritics, FBIS renders personal and place-names in accordance with the romanization systems approved for U.S. Government publications by the U.S. Board of Geographic Names.

Headlines, editorial reports, and material enclosed in brackets [] are supplied by FBIS/JPRS. Processing indicators such as [Text] or [Excerpts] in the first line of each item indicate how the information was processed from the original. Unfamiliar names rendered phonetically are enclosed in parentheses. Words or names preceded by a question mark and enclosed in parentheses were not clear from the original source but have been supplied as appropriate to the context. Other unattributed parenthetical notes within the body of an item originate with the source. Times within items are as given by the source. Passages in boldface or italics are as published.

SUBSCRIPTION/PROCUREMENT INFORMATION

The FBIS DAILY REPORT contains current news and information and is published Monday through Friday in eight volumes: China, East Europe, Soviet Union, East Asia, Near East & South Asia, Sub-Saharan Africa, Latin America, and West Europe. Supplements to the DAILY REPORTs may also be available periodically and will be distributed to regular DAILY REPORT subscribers. JPRS publications, which include approximately 50 regional, worldwide, and topical reports, generally contain less time-sensitive information and are published periodically.

Current DAILY REPORTs and JPRS publications are listed in *Government Reports Announcements* issued semimonthly by the National Technical Information Service (NTIS), 5285 Port Royal Road, Springfield, Virginia 22161 and the *Monthly Catalog of U.S. Government Publications* issued by the Superintendent of Documents, U.S. Government Printing Office, Washington, D.C. 20402.

The public may subscribe to either hardcover or microfiche versions of the DAILY REPORTs and JPRS publications through NTIS at the above address or by calling (703) 487-4630. Subscription rates will be

provided by NTIS upon request. Subscriptions are available outside the United States from NTIS or appointed foreign dealers. New subscribers should expect a 30-day delay in receipt of the first issue.

U.S. Government offices may obtain subscriptions to the DAILY REPORTs or JPRS publications (hardcover or microfiche) at no charge through their sponsoring organizations. For additional information or assistance, call FBIS, (202) 338-6735, or write to P.O. Box 2604, Washington, D.C. 20013. Department of Defense consumers are required to submit requests through appropriate command validation channels to DIA, RTS-2C, Washington, D.C. 20301. (Telephone: (202) 373-3771, Autovon: 243-3771.)

Back issues or single copies of the DAILY REPORTs and JPRS publications are not available. Both the DAILY REPORTs and the JPRS publications are on file for public reference at the Library of Congress and at many Federal Depository Libraries. Reference copies may also be seen at many public and university libraries throughout the United States.